G.R.S. IX—5]

Previous references. 1918. (Sanitary)

San 107-17 (6+7)
Med. 16-17 (7, 9, 14, 23, 24, 25 & 26)
Gen 46-17 (1-13) 28, 30, 31, 32 & 37)

Later references.
P.H. 1—40, Al. 13, 15, 22.

File No. 92—18

Serial Nos. 1—18

GENERAL AND REVENUE SECRETARIAT.

P. 128 E

Serial Nos. System

Part B for February 1920

SUBJECT

Review of the measures taken in the past for the arrest & prevention of Plague in the State & proposals for improving the existing arrangements

To the Sanitary Commissioner.
" Dy Comrs of Ds
" President & City Municipality of Bangalore & Mysore
" " H.Q. Staff Bd.
" Agent Mysore Railways
" Controller to Govt
" Dewan Secretary
" Conservator of Forests

Printed on the Multigraph.
No. S 18690-706 & 14-2-1920

Papers about on the Plague Preventive Measures

Revised up to 19.6.1920

(For Disposal at a Meeting)

No. C. 32

1919-2

GENERAL AND REVENUE SECRETARIAT.

Council Matter.

SUBJECT.

(Under clause xii of the schedule)

Review of the measures taken in the past for the arrest and prevention of plague in the State and proposals for improving the existing arrangements.

CIRCULATED TO THE MEMBERS OF COUNCIL.

By Order,

C. B. Saleswidge

Chief Secretary to Government.

2nd December 1919.

Extraordinary Member of Council.

3687-13
8-12-19 **First Member of Council.** 8-12-19

2715
3-12-19 **Second Member of Council.** 5/12

2053
6/12/19 **Third Member of Council.** 6/12

T. 4585
8-2-19.

10743.

WD 243—GPB—2,000—2-8-18

REPLY.

(*To be written on this margin.*)

Office of the Dewan of Mysore.

NOTE.

Dated 8th February 191 9.

San 92-16-1

1) Dr. M. Srinivasa Rao's note on Plague Measures and connected papers are forwarded to the Chief Secretary, with the request that copies may be printed and distributed to Sanitary and Revenue Officers for information. Twenty copies may be sent to Dr.Srinivasa Rao.

2) Brief notes may also be put up showing the action, if any, taken already:

1. to popularise the method of disinfection recommended by Dr.Srinivasa Rao

and

2. to arrange for a campaign of rat destruction,

3) The question of providing, in Municipal Bye-laws, for the construction of rat-proof houses and rat-proof go-downs for grains may also be considered.

4) I shall be obliged if a note on the above points and also giving statistics of deaths, expenditure under (1) State (2) Local Bodies, inoculation, Plague Hospitals, etc., since the first outbreak, is furnished to me within a month in consultation, if necessary, with the present

Sanitary Commissioner and the Revenue Secretary, so that a Government Resolution may issue on the subject.

8.2.19

The Chief Secretary to Government.

CR363

Chief Secy Noted.

Please take action at once.

CS 9/2

CS. Noted action regarding special subjects. CS 9/2

This will be treated as urgent until further orders. D.M.

D.M. 10/2

G. R. S. III-2j

10743

3

General and Revenue Secretariat. | Sam File No. 92 of 1918

Serial No.

6) Submitted with drafts (3).
7) Issues
to 2.19
8) Copy sent the Presidy. Bangalore & mysore municipalities also be addressed
D. M. 21/2

2 To The Sanry Comm
No 9 17306 Dt 14.2.19.
Forwards a copy of the notes prepared by Dr. M. Srinivasa Row and requests to submit brief notes showing the action taken, if any on certain points referred to in the letter

3 To The Supdt Govt Press, Bangalore.
No 9 17307 Dt 14.2.19.
Forwards the notes and requests to print 500 Copies and send to this office on the 20th instant.

4 To The Comptroller
No 9 17308 Dt. 14.2.19.
Forwards a copy of the notes and requests to furnish before the 20th instant, for the information of the Dewan a statement showing the expenditure incurred on account of plague prevention measures, since the first outbreak of plague upto end of June 1918 by 1) State and 2) Local bodies.

9) Printed copies have received on 20.2.19
Submitted with drafts.
20.2.19 21/2

10) Issues
D. M.
21/2

NOTE—Contn. sheet.

G. R. S. III-2]

General and Revenue Secretariat.

10763 4

San File No. 92 of 1918

Serial No.	
11)	The reply has not yet been received from the Secy Comm. Dewan wants this information before the 8th instant. Submitted with a draft p a D.O reminder to the Secy Comm. KHB 1/3/19. C&S 1/3
12)	Mark Issue attached. D. M. 2/3
	G19337 dt 4.3.19.
13)	Replies have not yet been received from the Presidents of the City Municipal Councils of Bangalore and Mysore. Submitted with a draft. KHB 5/3/19. C&S 5/3
14)	Issued.
15)	It was ascertained yesterday by telephone that the Hon'ble President (Bangalore) wants two days more & that Secy Comm has gone to Ranjangudi. Please note the progress made & submit on 8.3.19 for any extension of time. D. M. 6/3
	G19583-4 dt 6/3/19

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

General and Revenue Secretariat. | San File No. 92 of 1918.

Serial No.	
	To Dr. M. Seeniwasa Rao, Retired Sanitary Com. No. 4 (1883) & 27. 2. 19
	Forwards 20 copies of his report on plague in the Mysore State.
6	To, The Sanitary Commissioner, G 1883 & 27 2/19
	Forwards 300 copies of the note on plague by Dr. M. Seeniwasa Rao for distribution to Sanitary & Revenue officers for information.
7	To, The President, City Municipal Council of Bangalore & Mysore, No. 4 1883-98 27 2/19
	Forwards a copy of note on plague by Dr. M. Seeniwasa Rao & calls for certain information.
8	From the Comptroller No. 2369 & 18. 2. 19
	Forwards a statement showing the expenditure incurred on account of plague from State funds since the first outbreak upto the end of June 1918.
9	From the Surgeon General, No. 281 & 212. 19
	Forwards a statement showing the expenditure incurred (1) from Municipal funds (2) District Funds & (3) Mysore Civil Police Sanitary Board funds.
10	From the Sanitary Commr. No. C 328 & 63 3/19
	Submits the note called for in serial No. 1

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

General and Revenue Secretariat. | San File No. 92 of 1918

Serial No.

16) Anti-plague measures are grouped under the following heads:—

(1) Evacuation

(2) disinfection

(3) Inoculation.

In order to facilitate evacuation the Sanitary Commissioner has issued instructions to the Presidents of the Municipal and District Boards for the provision of sheds for use as health & Contact Camps. Health camps have been provided in Bangalore & Mysore cities. In villages people use their own huts & other materials and in places where materials are not procurable bamboos are supplied free from the Forest Dept to the poor and at cost price to others.

17) Disinfection of infected houses is undertaken by Kerosine oil emulsion and desiccation continued with fumigation with neem leaves. Special disinfection staff is maintained through out the year in Bangalore & Mysore cities. Temporary establishment is entertained in other places wherever necessary for disinfection of houses. The Dy Commrs have been

(enclosure p. 2 D)

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

Serial No.

authorising to incur an expenditure of Rs 500/- per mensem (vide Govt. Gen. No. G 2855-64-8 dt 8th August 18) Sm 46-17-13

Inoculation work is carried on by the Medical Officers & by the Health & District Sanitary Officers in

In some Cases Spl. inoculation Officers are appointed for particular localities.

18) In connection with anti-plague measures the Sanitary Commr with Govt of India suggests (1) Rat elimination or the prevention of rat infection and (2) The feasibility of insisting on rat-proof or rat-free godowns for the grain trade.

19) In March 18, Dr Srinivasan the then Sanitary Commr suggested that in Rampur and Town the reduction of rats during the Oil season might be tried as an experimental measure the proposal was sanctioned in Govt Gen. No. G 2894-6 dt 8.8.18. Sm 167-17-12

20) There are no municipal bye-laws, for the construction of rat-proof houses & rat proof godowns for grains.

The total number of plague attacks & deaths, since the 1st outbreak upto date

NOTE—Contn. sheet.

G. R. S. III-2]

11709
12357
12555

General and Revenue Secretariat. San File No. 92 of 1918.

Serial No.	
	A- 1917-18 Rs 27,3084 and 1,99860 respectively.
	21) The total expenditure incurred from 1896-97 upto 1917-18 on account of plague preventive measures from State funds is Rs 26,30,269/- Expenditure incurred from Municipal funds upto 1916-17 is Rs 2,51,556/- Do from Dt funds is Rs 2,91,06/- Do from the Sirsing Bore Kolarkhera Fields is Rs 18,893/-
	Total 29,98,04
	22) Details are not available in regard to the expenditure incurred for indemnity and for plague hospitals &c.
	Submitted 23) The replies from the Revenue Deptt of the Commissioner & Director City Municipal Councils have not been received. Reminders have also been issued.
	24) Time may be granted upto by 10 days
	(Chief Sec.)
	Noted & reply Dewan,
	25) Copy to 2 Chf Sec Dy Secy for information

* Sincerely (No: 261/Q. 10-3-19).

5326.
12-3-19.

NOTE—Contn. sheet.

Urgent
Submit to Sandy
Reminder every week

General and Revenue Secretariat. | Sanc File No. 92 of 1918

Serial No.	
11	From the President City Municipal Council, Bangalore, No 261 dated the 10th March 19 with reference to the motion played by Dr. M. Srinivasaraw, explaining briefly the action taken in the city in combating plague.
12	From the President City Municipal Council, Mysore, No 165 & 13.3.19 Submits a brief note showing the action taken on certain anti-plague measures referred to in the motion on plague in the Mysore State by Dr. M. Srinivasaraw.
	26 In the Bangalore city the payment of rewards for the destruction of rats has discontinued, with effect from October 1 A memorandum inviting the attention of the public to the importance of the measure of rat destruction in their houses was issued (vide Sanc. No.
No	2555-95 & 11th Oct 1917 / Sanc 26-10-17
	27 As regards the construction of rat proof houses and godowns, the President Bangalore City Municipality reports, that some arrangement may be instituted in the case of future construction of houses & godowns but legislation will be necessary

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

12655
12995

G. R. S. III-2]

General and Revenue Secretariat. | Genl File No. 92 of 1918.-19

Serial No.

The President City Municipal Council, Impm, states that if a sum of Rs 10000 & Rs 15000/- a year, is sanctioned from State funds for five years, rat destruction scheme will be given a trial.

Submitted for orders.

17.3.19 17/3

28. Please put up a note as noted in para 4 of the Dewan's order note dt 8.2.19.

D. M. 18/3

Note submitted

18.3.19 18/3

File sent to Chief Sec. on 18.3.19. & Returned to Branch 22.3.19

29. Please put the note typed as revised (half margin)

D. M. 26/3

Submitted

27.3.19 27/3

Send with a note

D. M. 28/3

Chief Sec.

30. A note giving a brief account of action taken till now is put up.

31. It is desirable to issue a fresh Resolution laying special stress on the value of prompt evacuation, prompt desiccation as suggested by Dr S. Rao, & incorporate

NOTE—Contn. sheet.

WD A 1789—GPB—60,000—20-3-18—S.

1295

G. R. S. III-2.

General and Revenue Secretariat.

Secy File No. 82 of 1918-19

11

Serial No.	
6	During epidemic seasons & in the reduction of the rat population during the off seasons. Arrangements maybe made for the supply of suitable traps & rat poison (Barium Carbonate) recommended by Dr S. Rao, either free of cost or at cost price to people who can be induced to use the same. Systematic destruction of rats should be undertaken, & though it might be impossible to kill off all rats there would be some benefit.
	32 The provision of Health Camps in temporary occupation, & the provision of hospital accommodation for plague patients, preferably as a separate ward attached to existing hospitals in Dt / Taluk Hqrs, and separate hospitals in the Bangalore & Mysore cities maybe ordered.
	Dewan Sahib / Rao Sahib — 2.4.19 — GMM — 30/3/19 — Dy C/C
	33 The Epidemic rule should be translated into Kannada & published in the gazette. A Gat sod should be drafted. Reading Dewan Sahib's note giving a brief account of the policy hitherto pursued regarding both of Rats & they and about plague prevention

DEWAN'S OFFICE.
Received on 7 APR 1919
Reg. No. 5984

Unpublished upto

NOTE—Contn. sheet

General and Revenue Secretariat: Secy File No. 92 of 1918. 12

Serial No.

April 18 –
Distribution of grants to
Each Dist for Plague prevention
& inspection & vaccination
measures – Same like spent
thro Dept of public health
Same thro local boards in Dist
Same thro Municipalities
Same thro Cantonments & Govt Comm.
Sp. D. regl rules for
issue of existing bens and
rules for grant in aid for rural
sanitation – & l. –
Enforce taking charge
in dwelling houses in
Plague infected villages
The Sp D. Hospitals and
Vaccination
Existing Plague Camps
in Dists to be remarked
Each Dist with a pop
of 2000 and to have
such a camp.
may also be provided for
the Bungalow Scheme
& Surplus Scheme
Total annual cost for
1919 20 & for the next
4 years on plague measures

Plague Camps & Staff to be abolished as early as possible

material for camp & evacuation &c

NOTE—Contn. sheet.

J. R. S. III-2]

12995

General and Revenue Secretariat. | San File No. 92 of 1918.-9

13

Serial No.

Shd be estimated

34 The resolution shd be submitted for approval thro' Members in Charge within one month.

WP
4.4.19

Assistant to Members.

Please bring up a draft for personal discussion in a week

WP
WP

Please put up draft by the 10th inst

D. 5/4/19

35 A draft is submitted. There is nothing in the E-D. Regns to enforce Rat Proofing of godowns.

11/4

To enforce the conditions of rat-proof dwellings & go-downs, suitable rules may be issued under S. 2 of the Epidemic Diseases Regn (II of 1897). Or, suitable bye-laws may be framed under R. 26 of the Rules recently issued in the G.O. of 25.3.19.

Submitted with draft.

D. 13/4

4234
22.4.19

Chief Secy

Temp. Member

C.S.
18/4/19

D. 19/4

NOTE—Contn. sheet.

12995 150

14

General and Revenue Secretariat.

Sam File No. 92 of 1918-19.

Serial No.

36 Please see the marginal minutes & the amendments in pencil.

Put up a clean draft for submission.

Early.

Asstt Secy 26/4.

OK 27/4/19 D. M.

Read from A. S. for clean draft on 6.5.19.

37 Pros the Sanit Comr's last week's abstract distribution may also be put up

D. M. 28/4

(Sanitation No. 110-14 is submitted)

OK 10.5.19

38 Clean draft submitted. It is a point for orders whether the Sanitary Commissioner may not be consulted with regard to the draft

Briefly this is the reason why linked

Please take this case with the above file.

D. M. 10/5.

688 10/5

39 Clean draft is submitted as ordered. Kind regards invited to the Sanit Comr's views about rat destruction as in the linked file (110/14). This may perhaps be sent to D.O. to the Sanit Comr for opinion.

D. M. 12/5.

As per the draft may be sent to him for his remarks if any. He has already been consulted on Dr S's note OK

Chief Secy? III Member?

40 The matter may be sent as a last of technical matters which require expert

OK 16/5/19.

D. M. 16/5.

4740 16.5.19

17/5 D. M. 21/5.

NOTE—Contn. sheet.

1995

R. S. III-2]

General and Revenue Secretariat. | Sanitary File No. 92 of 1918-19 | 15

Serial No.	
	W/ Submitted draft. 22.5.19 2/5 Dewan Dt. 24/5
13	To the Sanitary Commr. Prog 267/23 Dt 28.5.19. Forward a copy of the draft proposed to be issued & Calls for his opinion in the matter. W/ Reply has not been received from the Sanitary Commr. Send with a Draft & a D.O. reminder. 16/6. 16/6 Jone 16/6
14	From The Sanitary Commr. No G.C. 503-2 dt 8/7/19 Returns the draft order to getther with a Note Containing his suggestions. Dated. 9/7/19 W/ Reply rec'd from S.C yesterday & submitted for perusal. The suggestions of the S.C require examination. Dewan). 9/7/19. W/ The Sug/s his may be embodied as far as possible in the draft leaving Mechanical & Inelastic differences and Memorandum shall & the draft which type of stone or Gabion & what details should be

Dt 4 9/5 30 MAY 1919

DEWAN'S OFFICE. Rd. on JUL 9 1919 No. 235

NOTE—Contn. sheet.

G. R. S. III-2]

5 79 16

General and Revenue Secretariat. | Gen File No. 92 of 1918-19

Serial No.

Certified
attested
9/7/19

45) Resolution revised accdly.

46) Br. Please make a clean typed copy of the pages containing many corrections and put up today
Sd/-
10/7/19.

47) Typed copy put up
Sd/-
11/7/19

48) Draft suitably revised put up for approval
Sd/-
11/7

Ch Secy)
3rd member) 49) Sd/-
11/7/19

50) A fresh draft is put up
I am trying for his delay. Please may be submitted this evening.

DEWAN'S OFFICE.
Recd. on NOV 11 1919
Reg. No. 3175

Sd/-
7/11/19

Dewan)

51) Sd/-
7/11/19

52) May be circulated in Council.
Sd/-
7/11
26-11-19

NOTE—Contn. sheet.

53) As circulated
Sd/-
Sd/-
29/11

Extract from the Proceedings of the 514th *Meeting of the Council of His Highness the Maharaja, held at Bangalore on the* 8th January *19* 20.

17

---

541 9. Subject:- Clause xii of the Schedule.

Review of the measures taken in the past for the arrest and prevention of plague in the State and proposals for improving the existing arrangements.

Opinion of the Council.

The draft order may be approved.

(Sd.) M.Kantaraj Urs,
Dewan of Mysore.

"EXTRACT

C S Balasundaram

Chief Secretary to Government.

WD 1148—GPB—1,000—23-12-18

529

WD 1233—GPB—60,000—1-12-16—S.

C. 308

18

G. R. S. III-2]

General and Revenue Secretariat.

San File No. 92 of 1918.

Serial No.

56) To the Asst. Secretary, Branch III put up for kindly submitting the file to the Second Member of Council with a draft Final Note.

CBS 10/1/20 xcs

Wr Ad: Necessary.

57) D.F.N. (enclosed) CBS 12/1

3317/13-1-20

58) for approval (2nd Member) xcs 13/1/20.

Final Note signed by the member is put up. M. 15/1/20.

59) Please put up a D.S.N. xcs 16/1/20.

60) D.S.N. is put up. CBS 16/1 16/1/20

61) For approval (Ch. Secy.) xcs 16/1/20.

Dewan CBS 7/1/20 xcs

DEWAN'S OFFICE.
Recd. on JAN 17 1920
Reg. No. 4794

NOTE—Contn. sheet.

19

62

Final Note by the Second Member of Council.

Subject:- Review of the measures taken in the past for the arrest and prevention of plague in the State and proposals for improving the existing arrangements.

Dr.M.Srinivasa Rao, the late Sanitary Commissioner, submitted a note on the question of improving the existing arrangements for combating the epidemic of plague in the State reviewing the measures taken during the past 20 years. Under the orders of the then Dewan, Mr.A.R.Banerji, the note was printed and copies were distributed to Sanitary and Revenue Officers for information.

2. With a view to pass a comprehensive resolution on the subject, brief notes were put up under his orders on the following points:-

(1) The action already taken to popularise the method of disinfection recommended by Dr.Srinivasa Rao and to arrange for a campaign of rat destruction;

(2) The question of providing in Municipal Bye-laws for the construction of rat-proof houses and rat-proof godowns for grains;

(3) Statistics of deaths, expenditure on plague measures from State and Local Funds, inoculation, plague hospitals etc., since the first outbreak of plague in 1898.

3. After consultation with the present Sanitary Commissioner a draft order was prepared under my instructions which was considered at a meeting of the Council and it was resolved that the draft order might be approved.

Draft for approval

4. The resolution of the Council may be graciously approved.

1038

15th January 1920.

MEMBER OF COUNCIL.

68) *Submitted to His Highness.*

I submit herewith a Final Note by the Second *Member of Council on the subject of* the review of the measures taken in the past for the arrest and prevention of plague in the State and proposals for improving the existing arrangements, *for His Highness' gracious approval.*

19th January 1920

Dewan.

21

Record of Cases submitted for the Orders of His Highness the Maharaja

Subject.

Review of the measures taken in the past for the arrest and prevention of plague in the State and proposals for improving the existing arrangements.

779

66

Order.

~~KRW~~

21/1/20

65

22-1-20

G. R. S. III-2]

308

22

General and Revenue Secretariat.

San File No. 92 of 19 18

Serial No.

31. All urgent or confidential files returned with His Highness' orders may, in the absence of instructions or indications to the contrary, be ordinarily circulated to the Members of Council for perusal after the issue of orders.

33. The Secretaries concerned should see that orders in the cases referred to above are issued at once and that the files are returned immediately after to the Chief Secretary for circulation to the Members.

34. In all other cases, the files will first be circulated to the Members of Council at headquarters and then sent to the Secretariat concerned for the issue of orders.

69 Circulated to the Members of Council for perusal of His Highness' orders ~~before~~ after issue of orders. (*Vide* Rules 31, 33 and 34 of the Subsidiary Rules for the conduct of business of Council in the Manual of Council Rules and Procedure.)

C. Balasundaram
Chief Secretary to Govt. 23/1/20

Through the Secretary to Government,

.....Department.

4750-258
24-1-20.

FIRST MEMBER OF COUNCIL Seen (67) Reed 26-1-20.

3587
23-1-20

SECOND MEMBER OF COUNCIL (63) 24/1/20

2857
26/1/20

THIRD MEMBER OF COUNCIL. (65) 26/1

NOTE—Contn. sheet.

To issue in print.
Please submit clean proof to member.
28/1/20.

G. R. S. III-21

579 2

General and Revenue Secretariat. | Saing File No. 92 of 1918

Serial No.

7) Draft &c put up for appl
HSD 28.1.20 28/1

7) Issue DCS 28/1/20.

15 To The Supdt Govt Printing Bloe
No. 17450 dt 28-1-20
Request to set the matter in type and forward as early as possible two clean copies of the proof for approval.

HSD 9/2

RECEIVED 5-FEB 1920

73) Draft &c reminder put up for appl
HSD 9.2.20 9/2

74) Issue DCS 9/2/20

No 1824 dt 9.2.20.

75) Submitted with a copy of the proof received today with reference to HSD form 70 of 1919-20 in 10.2.20 last line of form 11 of draft may be approved & be entered into 1920-21.
For approval
DCS 11/2

2nd member)

DCS 11/2/20.

4085 11.2.20

Approved
Yes
12/2

Issue
DCS 13/2/20

The penultimate line of the draft as modified by the II member is put up in the file
HSD 19.2.20

issued

16. To The Secy Comm
The Dy Comm of Cfs
The Dists of Cfs The Commr of Bloe Mysore

NOTE—Contn. sheet.

(92)

G. R. S. III-2]

General and Revenue Secretariat.

Serial No.

Sany File No. 92 of 1918-19

To

The Addl K. G. F. Sany Coors

The Agent Mysore Railways.

The Comptroller.

The Dr Surgeon

The Conservator of Forests.

Proc. 18690-706 dt 14-2-20.

Passes orders on plague preventive measures

B/21/2

23 FEB 1920

NOTE—Contn. sheet.

Note. 25

Anti-plague measures are grouped under the following heads :-

(1) Evacuation
(2) Disinfection
(3) Inoculation and
(4) Rat destruction and building rat proof houses.

Anti-plague measures.

Enclosure to Paper under disposal

2. In order to facilitate evacuation the Sanitary Commissioner has issued instructions to the Presidents of the Municipal and District Boards regarding the provision of sheds for use as health - camps. Health camps have been provided in Bangalore and Mysore Cities. In Villages people use their own shed materials and in places where materials are not procurable bamboos are supplied from the - Forest Department free of cost to the poor and at cost price to others. Dr. Srinivasa Rao recommends that the houses should be disinfected after removing all the articles and that the houses should be re-occupied only after such disinfection.

Disinfection.

3. Disinfection of infected houses is ~~under taken~~ effected by Kerosine oil emulsion and desiccation combined with fumigation with neem leaves. Various methods of disinfection have been attempted and desiccation has been advocated during the past 2 years. Special disinfection staff is maintained throughout the year in Bangalore and Mysore Cities. Temporary establishment is entertained in other places wherever necessary for the disinfection of houses. The Deputy Commissioners have been authorised to - incur an expenditure of Rs. 50/- per mensem for this purpose.

96

Dr. Srinivasa Rao states that to facilitate prompt ~~an~~ evacuation and immediate desiccation all the local bodies have been instructed to keep a few permanent and temporary sheds for accommodation of people who have to vacate their houses owing to rat falls. The President, City Municipal Council, Mysore states that - experience has shown that none of the methods of disinfection can be considered efficient.

4. Inoculation work is carried ~~out~~ on by the Medical officers and ~~by~~ by the Health and District Sanitary Officers.

Rat Destruction and building rat proof houses and go-downs

5. In connection with anti-plague measures, the Sanitary Commissioner with the Government of India suggests (1) rat elimination or the prevention of rat infection and (2) the feasibility of ~~investing~~ inhibiting on rat proof or rat free go-downs for the grain trade

6. In March 1918, Dr. Srinivasa Rao suggested that in Nanjangud town the reduction of rats during the off season might be tried as an experimental measure. The proposal was sanctioned in Government Proceedings No.G.2894-6/San.107-17-12 dated 8th August 1918. No report has been received from the Sanitary Commissioner.

A report will be called for separately in this respect

28/3

Reports for 1917-18 ( )

The President, City Municipal Council, Mysore, states that if a sum of Rs.10,000/- to Rs. 15,000/- a year is sanctioned from State Funds, for five years rat ~~destruc-~~ this scheme for

destruction ~~scheme~~ will be given a trial.

In the Bangalore City the payment of rewards for the destruction of rats was discontinued in 1911. A memorandum inviting the attention of the public to the importance of rat destruction in their houses has been issued.

7. As regards the construction of rat proof houses and go-downs, the President, Bangalore City Municipality, reports that some arrangement may be insisted in in the case of future construction of houses and go-downs, and that legislation would be necessary. The President, Mysore City Municipality considers that immunity from rats depends not on the mere construction of rat proof houses and go-downs but on the manner in which they are looked after. He states that, in Bombay, the rat proof houses built by the Plague commission sometime ago contained rats after one year. Dr. Srinivasa Rao wants the Railway goods sheds ~~also~~ also to be constructed rat proof.

Statistics of plague attacks and deaths.

8. The total number of plague attacks and deaths, since the 1st out-break up to the end of 1917-18, is 2,73,084 and 1,99,840 respectively.

Statistics of expenditure.

9. The total expenditure incurred from 1896-97 up to 1917-18, on account of plague preventive measures, according to the Comptroller's account is Rs. 29,29,804.

Amount

188

Amount spent from State funds is	Rs.	26,30,249
Do from Municipal funds	Rs.	2,51,556
Do from District Funds	Rs.	29,106
Do from Sanitary Board funds, Kolar Gold Fields.	Rs.	18,893
Total	Rs.	29,29,804

10. Information has not been furnished in regard to the expenditure incurred for inoculation and for plague hospitals &c.

11. Dr. Srinivasa Rao says in his note, that it is no part of the duty of a Government or of a local body to build and equip any special plague hospitals.

Enc to Paper under Appeal

12. The instructions issued by the Sanitary Commissioner to the Presidents, District and Municipal Boards on 28th May 1918, as well as the rules for Combating Epidemics in rural as well as urban areas issued by Government on 24th March 1919 contain full instructions for combating plague.

27/3

27/3

A NOTE ON PLAGUE IN THE MYSORE STATE.

Seeing that it is now 2I years since Plgue entered the Mysore State, it may be worth while to review the situation as a whole.

Bangalore was the first place in the Province to become infected with Plague. The first case to be definitely diagnosed as Plague occurred on the I2th August I898. Plague was recognised in Bombay in August I896, the first severe epidemic occurring there in February I897. Though the people from Bombay & its suburbs fled to all parts of that Presidency and even beyond it, the diffusion of the disease was slow. This is one of the characteristics of Plague epidemics, showing that men coming from infected areas do not form centres for the dissemination of the disease. Plague spread slowly in the course of one year & nine months from Bombay down to Belgaum, Hubli & Dharwar, where there were severe epidemics in May I898. It took nearly 3 months for plague-infected rats to come in goods booked from the above named places to Bangalore & infect the local rats. Human epidemics are always preceded by epizootics among rats & allied animals. Thus a very high mortality among rats was observed in the localities surrounding the Railway goods sheds, but the intimate connection between this epizootic & the subsequent epidemic among men was believed to be one of mere coincidence & was not thought to be of any particular importance, as the then prevailing opinion was that the disease spread from man to man. The epidemic attained its maximum in October & November I898 & then began to go down gradually. In April I899 it had almost disappeared. In the adjacent C & M Station the epidemic began & ended a month later than in the City. In the first epidemic Bangalore, Kolar, Tumkur & Mysore districts were most affected. Since then Plague has spread to all the districts, the Malnad portions showing the greatest immunity.

The progress of the epidemic has shown great variations year by year. The severest epidemics were in I902, I903 & I904 with 26301, 20223, and 21622 deaths respectively. The next two years I905 & I906 were very good, there being only 3959 & 2960 deaths respectively. The years I907 & I9II were again very bad with I2424 & I46I7 deaths respectively. The three intervening years I908 I909 & I9I0 were comparatively mild with a much smaller number of deaths. It appeared as if

Plague had lost its severity as the 4 years I9I2,I9I3,I9I4 & I9I5 showed a progressive diminution in the number of deaths from 5376 to 3457. But that this belief was not well founded was shown when Plague carried off 9779 & I04I0 persons in I9I6 & I9I7 respectively. The fluctuations from year to year are so great that no safe conclusions can be drawn from them. But things appear to come out in a somewhat clearer light, when the Plague figures for five-yearly periods are considered. Thus in the first quinquennium from I898 to I902 there were 73726 attacks with 555I0 deaths, giving an annual average of I6384 attacks & I2336 deaths. In the second period from I903 to I907 there were 83927 attacks and 6II87 deaths, with the yearly average of I6785 attacks & I2237 deaths. In the third period from I908 to I9I2 there were 5I797 attacks with 37533 deaths, giving an annual average of I0359 attacks & 7506 deaths. In the fourth quinquennium from I9I3 to I9I7 there were 44576 attacks & 3I844 deaths, giving an annual average of 89I5 attacks & 6369 deaths. When the first decade is compared with the second, there is seen a marked diminution in the number of attacks from I,57,653 to 96,373 and quite as marked a decrease in the number of deaths from I,I6,697 to 69,377. In other words the number of attacks & deaths were less by 38.8 & 40.6 per cent respectively. Comparing the third with the fourth quinquennium the diminution in the latter as regards the number of attacks as well as of deaths is perceptible being I4 & I5.2 respectively.

These stricking facts appear to be explainable in the following way. It may be that the rats have acquired a greater immunity to the attacks of Plague bacilli in the second decade and that consequently epizootics among them were not so easily set up as in the first decade when there must have been far larger numbers of susceptible animals. Rats are of course now well recognised to be the carriers of plague infection from one season to another. When the susceptible animals are killed off, the surviving animals are able to transmit their acquired & inherited immunity to their young ones. This characteristic immunity being strengthened in each succeeding generation, there must ultimately arise a race of rats which are practically immune to Plague. An epizootic among rats being always a necessary preliminary to an epidemic among men, Plague stands a good chance of dying out in course of time when the rats acquire a complete immunity to the Plague

bacilli.The history of Plague epidemics in ancient times lends support to this view.Bombay was subject to periodical epidemics but had remained free from Plague for over 200 years.It had come to believe itself invulnerable to Plague & had to learn its bitter lesson anew.. It must of course not be forgotten that the Plague bacilli may develope an increased virulence so as to attack even immunised rats.. Men also may be acquiring some amount of immunity to Plague but to judge from the effects of repeated inoculations with Plague vaccine on them,this does not appear to be so very probable..

Every Government is obliged to take some measures to check the spread of Plague & cannot ~~to~~ afford to wait for the operation of Nature's laws to kill off susceptible rats & men and to breed a race immune to Plague.In the light of the knowledge then prevalent,the Government of Mysore resorted to (I)compulsory removal of plague patients to special hospitals (2)compulsory isolation of those that had come into contact with the patients (3) disinfection of infected houses & localities and (4) inoculation with the plague vaccine of those that were exposed to infection.These measures were conceived with the very best of intehtions on the part of the Government,but all the same the panic that seized the population was such ~~that~~ as to obscure their common sense & reasoning powers.The people had recourse to the usual step of concealing cases of Plague,of leaving dead bodies in the houses or throwing them into streets & finally of running away from the infected localities.The then Sanitary Commissioner used these words in his report on Plague for I898-99 "People ~~are~~ feared the Government & their measures more than Plague itself".In November I898 the compulsory removal of patients & their contacts was given up on account of its extreme unpopularity & the impossibility of enforcing the measure in face of the opposition both active & passive of the people.When in the same month Plague broke out in Mysore city,compulsory seggregation was never attempted & consequently there was no panic,no concealment of cases,no paralysis of trade & there was an enormous saving of public money.

Before the true method of transmission of plague infection to man was recognised & established,the strict examination of all persons coming from infected localities,issuing passports to them & keeping them under observation for I0 or more days,was in vogue in many places

outside the Mysore territory and continues to exist in a modified form showing conclusively how hard old prejudices die.It is fortunate that the Mysore Government never had recourse to this harassing,unnecessary & expensive measure..

Numerous experiments by competent men have established that Plague is primarily a disease of rats & only secondarily affects man when he lives in close association with them & other rodents.The epizootic among the rats has been proved to be caused by the bites of the rat-fleas.Close & continuous contact of plague infected rats with healthy ones,if fleas are excluded,does not give rise to an epizootic in the healthy animals.Even the suckling of the young by the plague infected mother does not give rise to the disease.It has also been proved that infected fleas from rats are the agents for the transmission of Plague bacilli from rats to man.It is thus evident that infected fleas alone are responsible for the starting of an epizootic among rats & of the subsequent epidemic among men.When infected fleas are present in any locality,an epizootic if it does start,varies in severity & rate of progress according to the season of the year,climatic conditions,the number of susceptible rats & the number of fleas present on each rat.. It is also well established that a mean temperature between 70 & 80 degrees Fahrenheit,associated with a " saturation deficiency" less than 0.30 inch is highly favourable for the starting & keeping up of a Plague epidemic.When the mean temperature rises above 80 degrees F.. with a high " saturation deficiency"the epidemic rapidly subsides.. The charts prepared on the above data for Bangalore & Mysore cities, show that atmospheric conditions have much to do with the starting & close of the Plague epidemics.

Though fleas die rapidly when exposed to the combined effects of high temperature & drying,experiments have been made which go to prove that plague infection may persist in fleas for 6 weeks in cold weather & subsuquently give rise to an epizootic in rats.The usual period in hot weather is only two weeks.It has also been established that Plague in bubonic & septicaemic forms is not infectious at all & that those attending on such patients do not incur any danger of catching the disease .It is only cases of Pneumonic Plague that are highly contagious through the medium of the sputum which is full of Plague bacilli. But fortunately,Plague in the pneumonic form is very uncommon & is not of much account in spreading the disease.But the prejudices are so deep-

deepseated that it is impossible to induce the majority of medical men to admit Plague cases of the bubonic & septicaemic variety into the wards of a General Hospital, where the infinitely more dangerous cases of Typhoid fever, Pneumonia, Phthisis &c are welcomed & treated by the side of other patients. Small blame then, to the educated & uneducated laymen who are afraid of Plague cases, fly from their relatives who may catch the disease and leave the dead bodies to be disposed of by the Government or Municipal authorities. At any rate it is no part of the duty of a Government or of a local body to build & equip any special Plague Hospitals.

All the facts detailed above are necessary to be borne in mind in devising & carrying out anti-plague measures. Those that are in vogue at the present day are (1) Evacuation (2) Disinfection and (3) Inoculation. Evacuation is an excellent measure if carried out thoroughly and at the proper moment. A house in which a dead rat has been found should be evacuated at once. The infected rat-fleas which have deserted the dead body of the rat will not attack man unless forced to do so. They always prefer to attach themselves to other rats and it is only in their absence that they bite men to obtain a meal of blood. Therefore if the occupants of such a house are wise, they will leave that house immediately removing all their belongings therefrom. But what goes by the name of evacuation ordinarily, is quite a different thing. The occupants generally throw away the dead rat into the street & act on the principle of "wait & see". If a human being is attacked with Plague they hurriedly leave the house, take a few essential things with them, leave most others in the house and lock it up. They themselves live perhaps in a temporary shed but one or more of them visit their locked-up house every day to look after their other things. The starving rat-fleas left in the house naturally bite the men & infect them with the Plague bacilli. Thus though the house has been nominally evacuated, plague cases will continue to occur in the sheds, in which the people live. They at once say that evacuation of the house has been of no use. Evacuation to be of any use must be thorough. That is to say, everything from the house should be taken out & if no desiccation is resorted to at once, the house should be kept locked up & not revisited by anybody on any pretext, till all the infected fleas die of starvation. It may perhaps be safe to return to the house after 6 weeks or 2 months. Even then it would be safer to desiccate the house prior to reoccupation. The difficulty in the earlier years of

Plague was to get the people to evacuate the houses,but now the difficulty experienced is to get the evacuated houses immediately desiccated and reoccupied within a reasonable period of time,say within a week or ten days.Nothing is more distressing than to see rows & rows of houses all locked up & left unoccupied for months together.The people have yet to learn that the object of evacuation is to allow of the house being disinfected & freed from infected fleas.The local officers entrusted with Plague preventive measures,have yet to comprehend how the Plague bacilli leave the body of the infected man,how they enter the body of the non-infected person and how they maintain themselves in the interval. The idea of rats being the carriers of Plague bacilli,of rat-fleas being concerned in the transmission of Plague bacilli from rat to man,of the impossibility of a patient with bubonic or septicaemic variety of Plague transmitting the bacilli to healthy man,is quite unfamiliar to them.The Government Officers must first be instructed before they can be expected to conduct anti-plague measures intelligently.

The object of all methods of disinfection is to destroy the infection. In the first decade of the prevalence of Plague it was believed that Plague was a soil infection & that Plague bacilli remained alive on the flooring for a long time.All sorts of chemical disinfectants e.g.Corrosibe Sublimate,Phenyle & its congeners,electrolysed salt solution,&c were tried.The floors used to be drenched in these solutions & no good was ever observed.Huge sums of money were spent on the disinfection of the clothing of persons coming from infected localities. For a time the emulsion of Kerosene oil or Pesterine in soap solution was used but its efficacy as a destroyer of fleas was found to be of a doubtful character. Its use is being gradually given up. All these methods were abandoned in favour of disinfection by heat.This was in the beginning conducted by placing heaps of dried cow-dung cakes in various parts of an infected house & setting fire to them after closing all doors & windows.It was believed that all the Plague bacilli on the ground would be destroyed & that a certain intensity of heat was necessary for this purpose. This process though carried out under a wrong impression,was found to be efficacious,inasmuchas it destroyed all vermin including fleas. However,it was not widely adopted as it was a rather troublesome process & required a certain amount of intelligent supervision.Later on,it became the fashion to have fumigation by burning " neem" leaves.What effect the smoke could possibly have,nobody stopped to consider.Even now in many

in places it is popular, from some vague belief in the medicinal virtues of " neem" leaves. But now that the real transmitting agent of Plague bacillus is known to be the rat-flea, the process of desiccation in a very simple form has been advocated during the last two years & is slowly gaining the confidence of the people. Instructions have been issued to remove all articles from a house in which a dead rat was seen, to spread a thin layer of paddy straw or dried leaves or any thing which will easily catch fire, all over the house & set fire to it. This is quite enough to kill all the fleas & the house becomes fit for reoccupation immediately afterwards. The doors & windows need not be closed & there will be no chance of even thatched ceilings catching fire if ordinary & common sense precautions are taken. The cost is trifling & if necessary the Municipal Councils & local officers can supply the straw &c free to the very poor people. To facilitate prompt evacuation & immediate desiccation, all the local bodies have been instructed to keep ready a few permanent or temporary sheds for the accommodation of people who have to vacate their houses owing to rat-falls. As soon as their own houses have been desiccated, the people are expected to reoccupy them, making room for other families whose houses may require desiccation.

Prophylactic inoculation against Plague was introduced by Haffkine in I897 & it has been slowly making its way, but still meets with much opposition on various grounds. The chief of these is that the immunity actively produced by inoculation, is only of short duration, not lasting longer than 6 months. Repeated inoculations are therefore called for, at each fresh epidemic. It is also open to consideration how far it is desirable or even justifiable to protect large masses of people from the consequences of their insanitary shortcomings, by inoculating them with a vaccine made from the disease germs whose attacks they practically invite by the manner of their living in close association with rats & the condition of their dwellings. But until the people are educated so far as to recognise the rat-flea as the transmitting agent of Plague germs from rat to rat & from rat to man, and to destroy the rat-flea by the simple process of desiccation as soon as a dead rat is seen, it is the duty of the Government to give facilities for inoculation, to all those people who thoughtlessly expose themselves to the danger of infection with the Plague bacillus.

After all, evacuation, disinfection & inoculation are mere temporary palliatives, while the plague epidemic is in progress. The real anti-plague

measure is the dissociation of man from rats.A regular campaign against rats has been advocated but there are certain principles to be observed to get the greatest benefit therefrom.In all plague infected places , there is a plague season & an off-plague season.Our experience during the last 21 years shows us that the plague season is generally from July to March & that the off-season consists of 3 months,April,May & June. The best period for carrying on a rat campaign is the off-season. The number of susceptible rats & the fleas on them has already been diminished greatly by Plague during the season & the adoption of rigorous measures in the off-season by means other than Plague,will have the greatest chance of success.The use of traps on an extensive scale in suitable localities where conditions are favourable,with baits containing Barium Carbonate,is particularly to be recommended.A proposal on these lines was made in the case of Nanjangud last year,but Government orders came too late to put it into effect.Places similar to Nanjangud may be selected & the campaign against rats conducted vigorously under the supervision of Officers who understand the rationale of the process & are convinced of its utility.

Such efforts will do well in small towns & villages.But in larger cities like Bangalore & Mysore the best anti-plague measure is the construction of rat-proof houses & keeping them in a rat-proof condition.Very little attention has been paid to this till now.Even in the better classes of houses that have sprung up in the extensions,the flooring is formed of earth coated with repeated layers of cowdung.Rats have every chance of burrowing in such houses & making them their permanent habitation. Suitable municipal bye-laws should be framed & the rat-proofing of every house should be insisted on.Rat-proofing is not a costly process and every man that can afford to build a house,can also afford to make it rat-proof.The problem of overcoming Plague thus resolves itself into that of providing suitable rat-proof housing accommodation to the poorer sections of the community who are unable to help themselves.Half-hearted efforts are of course being made by building the so-called model houses & selling them at cost price to the people,by giving loans to those who wish to build their own houses & by encouraging cooperative building societies.But all these,good as they are,do not reach the really poorer classes of the population. The problem may be tackled in one of two ways. Capitalists with philanthropic tendencies must take this question serious-

seriously in hand, build sanitary rat-proof houses & let them out at cheap rents, not expecting more than 2 to 3 per cent interest on the capital sunk in the scheme. Or the Government should give large subsidies to special cooperative societies for building the necessary houses for the poor, renting them out, preventing overcrowding, collecting the rents and keeping the houses in proper repair. The Municipalities are too poor to deal with this problem successfully. Opening out extensions, & spending large sums of money on them will do no good, for it is only the fairly well-to-do & middle classes of people that take advantage of them. The very poor people & labourers who flock to industrial centres for earning wages, without any intention of settling there will never build houses in the large cities. It goes without saying that this would cost a good deal but it would be money well spent & the return comes in, in the shape of improved health of the people, more efficiency, more wages earned by them, rise in the standard of living and lastly far fewer deaths from this very preventible disease Plague. Setting aside all humanitarian considerations, it is well worth while to consider whether it is cheaper in the end to establish Hospitals & Dispensaries for the treatment of the sick or to improve the conditions under which the poor are allowed to live & contract preventible diseases.

Storage of grain in large quantities attracts rats & therefore Municipal bye-laws should insist on shopkeepers & owners of Mandies building rat-proof shops & godowns and on their killing periodically all rats that may chance to enter them. This measure is all the more necessary in the larger grain distributing centres. The merchants cannot complain of any hardship as the rat-proofing is required in their own interests to prevent any dislocation of trade consequent on a plague epidemic. It is also incumbent on the State to see that the goods sheds in all Railway stations within the Province, are constructed rat-proof & that they are subjected to the process of periodical clearence of rats.

Bangalore
18th January 1919

M. Srinivasa Rau
Sanitary Commissioner
(Retired).

G. R. S. VI—G/321

Immediate

28
3 Sheets

SUBJECT.....

.....

.....

Diary No. of letter replied to .....

GENERAL AND REVENUE SECRETARIAT

( )

191 .

Date of issue 14.2.19

Signed by M. O. M.

Section

File No.

Serial No. 2

No. G 17306

To

The Printing Commissioner

Sir

I am directed to forward herewith a copy of rules on plague in the Bayonne Station by Dr. Mosinnik and to request you to be so kind as to submit brief rules showing the action taken, if any on the following heads:—

(1) To prevent the means of disinfection recommended

over. by

Encl.
14/2

14/2

39

by Mr. Srinivasan Rao.

(2) To arrange for a campaign of rat destruction &

3) the question of providing in Municipal Bye-laws, for the Construction of rat-proof houses and rat-proof go-downs for grains.

2. I am also to request you to furnish information giving statistics of deaths, expenditure under (1) State and (2) Local Bodies, inoculation, plague Hospitals &c since the first outbreak upto the July 1918 besides the 2 Sanitary Assistants in connection with the Local Bodies, if necessary

3. The matter may be treated as very urgent as the information is required by the Govt.

I have &c

D. M/r

for Chief Secy

List of enclosures.

Copied by

Examined by

WDS6—GPB—60,000—15.11.16

C&S

Cpr

40

A NOTE ON PLAGUE IN THE MYSORE STATE.

Seeing that it is now 21 years since plague entered the Mysore State, it may be worth while to review the situation as a whole. Bangalore was the first place in the State to become infected with plague. The first case to be definitely diagnosed as plague occurred on the 12th August 1898. Plague was recognised in Bombay in August 1896, the first severe epidemic occurring there in February 1897. Though the people from Bombay and its suburbs fled to all parts of that Presidency and even beyond it, the diffusion of the disease was slow. This is one of the characteristics of plague epidemics, showing that men coming from infected areas do not form centres for the dissemination of the disease. Plague spread slowly in the course of one year and nine months from Bombay down to Belgaum, Hubli and Dharwar, where there were severe epidemics in May 1898. It took nearly 3 months for plague-infected rats to come in goods booked from the abovenamed places to Bangalore and infect the local rats. Human epidemics are always preceded by epizootics among rats and allied animals. Thus a very high mortality among rats was observed in the localities surrounding the Railway goods-sheds, but the intimate connection between this epizootic and the subsequent epidemic among men was believed to be one of mere coincidence and was not thought to be of any particular importance, as the then prevailing opinion was that the disease spread from man to man. The epidemic attained its maximum in October and November 1898 and then began to go down gradually. In April 1899, it had almost disappeared. In the adjacent C. & M. Station, the epidemic began and ended a month later than in the City. In the first epidemic, Bangalore, Kolar, Tumkur and Mysore Districts were most affected. Since then plague has spread to all the districts, the Malnad portions showing the greatest immunity.

The progress of the epidemic has shown great variations year by year. The severest epidemics were in 1902, 1903 and 1904, with 26,301, 20,223 and 21,622 deaths respectively. The next two years 1905 and 1906 were very good, there being only 3,959 and 2,960 deaths respectively. The years 1907 and 1911 were again very bad with 12,424 and 14,617 deaths respectively. The three intervening years 1908, 1909 and 1910 were comparatively mild with a much smaller number of deaths. It appeared as if plague had lost its severity, as the 4 years 1912, 1913, 1914 and 1915 showed a progressive diminution in the matter of deaths from 5,376 to 3,457. But that this belief was not well founded was shown when plague carried off 9,779 and 10,410 persons in 1916 and 1917 respectively. The fluctuations from year to year are so great that no safe conclusions can be drawn from them. But things appear to come out in a somewhat clearer light, when the plague figures for five yearly periods are considered. Thus in the first quinquennium from 1898 to 1902 there were 73,726 attacks with 55,510 deaths, giving an annual average of 16,384 attacks and 12,336 deaths. In the second period from 1903 to 1907 there were 83,927 attacks and 61,187 deaths with the yearly average of 16,785 attacks and 12,237 deaths. In the third period from 1908 to 1912 there were 51,797 attacks with 37,533 deaths, giving an annual average of 10,359 attacks and 7,506 deaths. In the fourth quinquennium from 1913 to 1917 there were 44,576 attacks and 31,844 deaths, giving an annual average of 8,915 attacks and 6,369 deaths. When the first decade is compared with the second, there is seen a marked diminution in the number of attacks from 157,653 to 96,373 and quite as marked a decrease in the number of deaths from 116,697 to 69,377. In other words, the number of attacks and deaths were less by 38·8 and 40·6 per cent respectively. Comparing the third with the fourth quinquennium the diminution in the latter as regards the number of attacks as well as of deaths is perceptible being 14 and 15·2 respectively.

These striking facts appear to be explainable in the following way. It may be that the rats have acquired a greater immunity to the attacks of plague bacilli in the second decade and that consequently epizootics among them were not so easily set up as in the first decade, when there must have been far larger numbers of susceptible animals. Rats are of course now well recognised to be the carriers of plague infection from one season to another. When the susceptible animals are killed off, the surviving animals are able to transmit their acquired and inherited immunity to their young ones. This characteristic immunity being strengthened in each succeeding generation, there must ultimately arise a race of rats which are practically immune to plague. An epizootic among rats being always a necessary preliminary to an epidemic among men, plague stands a good chance of dying out in course of time when the rats acquire a complete immunity to the plague bacilli. The history of plague epidemics in ancient times lends support to this view. Bombay was subject to periodical epidemics but had remained free from plague for over 200 years. It had come to believe itself invulnerable to plague and had to learn its bitter lesson anew. It must of course not be forgotten.

inoculating them with a vaccine made from the disease germs whose attacks they practically invite by the manner of their living in close association with rats and the condition of their dwellings. But until the people are educated so far as to recognise the rat-flea as the transmitting agent of plague germs from rat to rat and from rat to man, and to destroy the rat-flea by the simple process of desiccation as soon as a dead rat is seen, it is the duty of the Government to give facilities for inoculation, to all those people who thoughtlessly expose themselves to the danger of infection with the plague bacillus.

After all, evacuation, disinfection and inoculation are mere temporary palliatives, while the plague epidemic is in progress. The real anti-plague measure is the dissociation of man from rats. A regular campaign against rats has been advocated but there are certain principles to be observed to get the greatest benefit therefrom. In all plague infected places, there is a plague season and an off-plague season. Our experience during the last 21 years shows us that the plague season is generally from July to March and that the off-season consists of three months, April, May and June. The best period for carrying on a rat compaign is the off-season. The number of susceptible rats and the fleas on them has already been diminished greatly by plague during the season and the adoption of rigorous measures in the off-season by means other than plague, will have the greatest chance of success. The use of traps on an extensive scale in suitable localities where conditions are favourable, with baits, containing Barium carbonate, is particularly to be recommended. A proposal on these lines was made in the case of Nanjangud last year, but Government orders came too late to put it into effect. Places similar to Nanjangud may be selected and the campaign against rats conducted vigorously under the supervision of officers who understand the rationale of the process and are convinced of its utility.

Such efforts will do well in small towns and villages. But in larger cities like Bangalore and Mysore the best antiplague measure is the construction of rat-proof houses and keeping them in a rat-proof condition. Very little attention has been paid to this till now. Even in the better classes of houses that have sprung up in the extensions, the flooring is formed of earth coated with repeated layers of cow-dung. Rats have every chance of burrowing in such houses and making them their permanent habitation. Suitable municipal bye-laws should be framed and the rat-proofing of every house should be insisted on. Rat-proofing is not a costly process and every man that can afford to build a house, can also afford to make it rat-proof. The problem of overcoming plague thus resolves itself into that of providing suitable rat-proof housing accommodation to the poorer sections of the community who are unable to help themselves. Half-hearted efforts are of course being made by building the so-called model houses and selling them at cost price to the people, by giving loans to those who wish to build their own houses and by encouraging co-operative building societies. But all these, good as they are, do not reach the really poorer classes of the population. The problem may be tackled in one of two ways. Capitalists with philanthropic tendencies must take this question seriously in hand, build sanitary rat-proof houses and let them out at cheap rents, not expecting more than 2 to 3 per cent interest on the capital sunk in the scheme. Or the Government should give large subsidies to special co-operative societies for building the necessary houses for the poor renting them out, preventing overcrowding, collecting the rents and keeping the houses in proper repair. The Municipalities are too poor to deal with this problem successfully. Opening out extensions and spending large sums of money on them will do no good for it is only the fairly well-to-do and middle classes of people that take advantage of them. The very poor people and labourers who flock to industrial centres for earning wages without any intention of settling there, will never build houses in the large cities. It goes without saying that this would cost a good deal but it would be money well spent and the return comes in, in the shape of improved health of the people, more efficiency, more wages earned by them, rise in the standard of living and lastly far fewer deaths from this very preventable disease plague.' 'Setting aside all humanitarian considerations, it is well worth while to consider whether it is cheaper in the end to establish hospitals and dispensaries for the treatment of the sick or to improve the conditions under which the poor are allowed to live and contract preventable diseases.

Storage of grain in large quantities attracts rats and therefore Municipal Bye-laws should insist on shop-keepers and owners of mandies building rat-proof shops and godowns and on their killing periodically all rats that may chance to enter them. This measure is all the more necessary in the larger grain distributing centres. The merchants cannot complain of any hardship as the rat-proofing is required in their own interests to prevent any dislocation of trade consequent on a plague epidemic. It is also incumbent on the State to see that the goods-sheds in all railway stations within the State are constructed rat-proof and that they are subjected to the process of periodical clearance of rats.'

W D 1522—GPB—500—20-2-19.

that the plague bacilli may develop an increased virulence so as to attack even immunised rats. Men also may be acquiring some amount of immunity to plague but to judge from the effects of repeated inoculations with plague vaccine on them, this does not appear to be so very probable.

Every Government is obliged to take some measures to check the spread of plague and cannot afford to wait for the operation of Nature's laws to kill off susceptible rats and men and to breed a race immune to plague. In the light of the knowledge then prevalent the Government of Mysore resorted to (1) compulsory removal of plague patients to special hospitals, (2) compulsory isolation of those that had come into contact with the patients, (3) disinfection of infected houses and localities and (4) inoculation with the plague vaccine of those that were exposed to infection. These measures were conceived with the very best of intentions on the part of the Government, but all the same, the panic that seized the population was such as to obscure their common sense and reasoning powers. The people had recourse to the usual step of concealing cases of plague, of leaving dead bodies in the houses or throwing them into streets and finally of running away from the infected localities. The then Sanitary Commissioner used these words in his report on plague for 1898-99 "People feared the Government and their measures more than Plague itself." In November 1898, the compulsory removal of patients and their contacts was given up on account of its extreme unpopularity and the impossibility of enforcing the measure in face of the opposition both active and passive of the people. When in the same month plague broke out in Mysore City, compulsory segregation was never attempted and consequently there was no panic, no concealment of cases, no paralysis of trade and there was an enormous saving of public money.

Before the true method of transmission of plague ~~inspection~~ infection to man was recognised and established, the strict examination of all persons coming from infected localities, issuing passports to them and keeping them under observation for 10 or more days was in vogue in many places outside the Mysore territory and continues to exist in a modified form, showing conclusively how hard old prejudices die. It is fortunate that the Mysore Government never had recourse to this harassing, unnecessary and expensive measure.

Numerous experiments by competent men have established that plague is primarily a disease of rats and only secondarily affects man when he lives in close association with them and other rodents. The epizootic among the rats has been proved to be caused by the bites of the rat-fleas. Close and continuous contact of plague infected rats with healthy ones, if fleas are excluded, does not give rise to an epizootic in the healthy animals. Even the suckling of the young by the plague infected mother does not give rise to the disease. It has also been proved that infected fleas from rats are the agents for the transmission of plague bacilli from rats to man. It is thus evident that infected fleas alone are responsible for the starting of an epizootic among rats and of the subsequent epidemic among men. When infected fleas are present in any locality, an epizootic if it does start, varies in severity and rate of progress according to the season of the year, climatic conditions, the number of susceptible rats and the number of fleas present on each rat. It is also well established that a mean temperature between 70 and 80 degrees Fahrenheit, associated with a "saturation deficiency" less than 0·30 inch is highly favourable for the starting and keeping up of a plague epidemic. When the mean temprature rises above 80 degrees F. with a high "saturation deficiency," the epidemic rapidly subsides. The charts prepared on the above data for Bangalore and Mysore Cities, show that atmospheric conditions have much to do with the starting and close of the plague epidemics.

Though fleas die rapidly when exposed to the combined effects of high temperature and drying, experiments have been made which go to prove that plague infection may persist in fleas for 6 weeks in cold weather and subsequently give rise to an epizootic in rats. The usual period in hot weather is only two weeks. It has also been established that plague in bubonic and septicaemic forms is not infectious at all and that those attending on such patients do not incur any danger of catching the disease. It is only cases of pneumonic plague that are highly contagious through the medium of the sputum which is full of plague bacilli. But fortunately, plague in the pneumonic form is very uncommon and is not of much account in spreading the disease. But the prejudices are so deep-seated that it is impossible to induce the majority of medical men to admit plague cases of the bubonic and septicaemic variety into the wards of a General Hospital, where the infinitely more dangerous cases of typhoid fever, pneumonia, phthisis, etc., are welcomed and treated by the side of other patients. Small blame then, to the educated and uneducated laymen who are afraid of plague cases, fly from their relatives who may catch the disease and leave the dead bodies to be disposed of by the Government or Municipal authorities. At any rate it is no part of the duty of a Government or of a local body to build and equip any special Plague Hospitals.

All the facts detailed above are necessary to be borne in mind in devising and carrying out anti-plague measures. Those that are in vogue at the present day are (1) Evacuation (2) Disinfection and (3) Inoculation. Evacuation is an excellent measure if carried out thoroughly and at the proper moment. A house in which a dead rat has been found should be evacuated at once. The infected rat-fleas which have deserted the dead body of the rat

will not attack man unless forced to do so. They always prefer to attach themselves to other rats and it is only in their absence that they bite men to obtain a meal of blood. Therefore if the occupants of such a house are wise, they will leave that house immediately removing all their belongings therefrom. But what goes by the name of evacuation ordinarily, is quite a different thing. The occupants generally throw away the dead rat into the street and act on the principle of "wait and see." If a human being is attacked with plague they hurriedly leave the house, take a few essential things with them, leave most others in the house and lock it up. They themselves live perhaps in a temporary shed but one or more of them visit locked-up house every day to look after their other things. The starving rat-fleas left in the house naturally bite the men and infect them with the plague bacilli. Thus though the house has been nominally evacuated, plague cases will continue to occur in the sheds, in which the people live. They at once say that evacuation of the house has been of no use. Evacuation to be of any use must be thorough. That is to say, everything from the house should be taken out and if no desiccation is resorted to at once, the house should be kept locked up and not revisited by anybody on any pretext, till all the infected fleas die of starvation. It may perhaps be safe to return to the house after 6 weeks or two months. Even then it would be safer to desiccate the house prior to re-occupation. The difficulty in the earlier years of plague was to get the people to evacuate the houses, but now the difficulty experienced is to get the evacuated houses immediately desiccated and re-occupied within a reasonable period of time, say within a week or ten days. Nothing is more distressing than to see rows and rows of houses all locked up and left unoccupied for months together. The people have yet to learn that the object of evacuation is to allow the house being disinfected and freed from infected fleas. The local officers entrusted with plague preventive measure, have yet to comprehend how the plague bacilli leave the body of the infected man, how they enter the body of the non-infected person and how they maintain themselves in the interval. The idea of rats being the carriers of plague bacilli, of rat-fleas being concerned in the transmitting of plague bacilli from rat to man, of the impossibility of a patient with bubonic or septicaemic variety of plague transmitting the bacilli to healthy man, is quite unfamiliar to them. The Government officers must first be instructed before they can be expected to conduct anti-plague measures intelligently.

The object of all methods of disinfection is to destroy the infection. In the first decade of the prevalence of plague it was believed that plague was a soil infection and that plague bacilli remained alive on the flooring for a long time. All sorts of chemical disinfectants, *e.g.*, Corrosible Sublimate, Phenyle and its congeners, electrolysed salt solution, etc., were tried. The floors used to be drenched in these solutions and no good was ever observed. Huge sums of money were spent on the disinfection of the clothing of persons coming from infected localities. For a time the emulsion of kerosene oil or pesterine in soap solution was used but its efficacy as a destroyer of fleas was found to be of a doubtful character. Its use is being gradually given up. All these methods were abandoned in favour of disinfection by heat. This was in the beginning conducted by placing heaps of dried cow-dung cakes in various parts of an infected house and setting fire to them after closing all doors and windows. It was believed that all the plague bacilli on the ground would be destroyed and that a certain intensity of heat was necessary for this purpose. This process though carried out under a wrong impression, was found to be efficacious, in asmuch as it destroyed all vermin including fleas. However, it was not widely adopted as it was a rather troublesome process and required a certain amount of intelligent supervision. Later on, it became the fashion to have fumigation by burning "neem," leaves. What effect the smoke could possibly have, nobody stopped to consider. Even now in many places it is popular, from some vogue belief in the belief in the medicinal virtues of "neem" leaves. But now that the real transmitting agent of plague bacillus is known to be the rat-flea, the process of desiccation in a very simple form has been advocated during the last two years and is slowly gaining the confidence of the people. Instructions have been issued to remove all articles from a house in which a dead rat was seen, to spread a thin layer of paddy straw or dried leaves or any thing which will easily catch fire, all over the house and set fire to it. This is quite enough to kill all the fleas and the house becomes fit for re-occupation immediately afterwards. The doors and windows need not be closed and there will be no chance of even thatched ceilings catching fire if ordinary and common sense precautions are taken. The cost is trifling and, if necessary, the Municipal Councils and local officers can supply the straw, etc., free to the very poor people. To facilitate prompt evacuation and immediate desiccation all the local bodies have been instructed to keep ready a few permanent or temporary sheds for the accommodation of people who have to vacate their houses owing to rat-falls. As soon as their own houses have been desiccated, the people are expected to re-occupy them, making room for other families whose houses may require desiccation.

Prophylactic inoculation against plague was introduced by Haffkine in 1897 and it has been slowly making its way, but still meets with much opposition on various grounds. The chief of these is that the immunity actively produced by inoculation is only of short duration not lasting longer than six months. Repeated inoculations are therefore called for, at each fresh epidemic. It is also open to consideration how far it is desirable or even justifiable to protect large masses of people from the consequences of their insanitary shortcomings, by

G. R. S. VI—G/32]

44

3 Months

SUBJECT..... Immoral .....

.....

.....

Diary No. of letter replied to.....

GENERAL AND REVENUE SECRETARIAT

( )

, the *191* .

Date of issue..... 14.2.49 .....

Signed by..... Mr Pr .....

Section

File No.

Serial No. 3

Urgent No. 5/1700/7

One

To

The Superintendent

Govt. Press, Bangalore

Sir

I am directed to forward herewith a copy of a note on plagues by Dr. H. Govindaraja Rao and to request that the pamphlet may be caused to be printed and 500 copies of the same may be sent to this office on the 15th instant for distribution to the Sanitary

over.

Ch/14/2

Immediate
3 Ships

46

G. R. S. VI—G/32]

SUBJECT.....

.....

.....

Diary No. of letter replied to.....

GENERAL AND REVENUE SECRETARIAT

( )

, the *191* .

Section

File No.

Serial No. 4

No. G/7308

Date of issue 14.2.19

Signed by Mr Pym

To The Commissioner in Lyon

Sir

I am directed to request you to be so good as to furnish before the 20th instant, for the information of the Secretary of State a statement showing the expenditure incurred on account of plague preventive measures, since the first outbreak of plague up to the end of June 1918 (1) month by State

over.

Sd A
P/2

Ex 11/2

Take out (2) Local Acts.

I have
D. W. 1972
Publish

685
1972

List of enclosures.

Copied by

Examined by

W D86—G P B—60,000—15-11-16

Statement showing the population, income & expenditure

Serial No	Name of the Municipality	Population.(1)	Income (2)
	Bangalore District		Rs
1	Bangalore city	88,651	9,97,013
2	Horakote	4,552	6,100
3	Doddaballapur	7,272	8,659
4	Nelamangala	1,666	8,230
5	Tyamagondlu	3,022	10,858
6	Kankanhalli	4870	4327
7	Magadi	3024	8,125
8	Closepet	3506	4,452
9	Channapatna	7624	24,071
10	Anekal	4,587	6580
11	Sarjapur	2681	4462
12	Devanhalli	6313	7,569
13	Vadigenhalli	4,376	6,669
	Kolar District		
	Kolar	8,193	46,131
2	Bowringpet	2,908	30,985

Note 1. According to Mysore Census of 1911 Vol V
2. " " Budget Estimates of Municipalities for 1918-19
As sanctioned by Govt

& the contribution they have to make for epidemic charges.

Expenditure (1)	Amount provided for epidemics in current budget (2)	Amount of contribution at Rs 1000 for a population of 10000.	Remarks.
Rs	Rs	Rs	
8,32,512.	13,224	8865	
5,271	400	455	
5,715	400	727	
3,551	100	167	
3,473	100	302	
3,341	100	487	
4,820	120	302	
4,413	40	351	
18,550	500	762	
4,000	100	459	
1982	50	268	
4,667	300	631	
3,646	100	438	
35,349	500	819	
14,300	400	291	

Serial no	Name of the Municipality	Population	Income
3	Chintamani	2,570	39,775
4	Srinivaspur	3,430	3,950
5	Mulbagal	2,677	6,462
6	Kolar	6,512	9,795
7	Chikballapur	1,661	58,927
8	Bagepalli	1,962	2,067
9	Gauribidanur	2,392	2,995
10	Gowribidanur	2,617	5,486
11	Malur	4,212	7,732
	Tumkur District		
1	Tumkur	6,039	54,521
2	Maddagiri	4,545	13,155
3	Koratagere	2,965	3,993
4	Chiknayakanhalli	5,188	11,240
5	Sira	5,573	13,359
6	Gubbi	3,464	12,519

Expenditure	Amount provided for epidemics	Amount provided by Govt. at Rs 1000 per 100,000 of pop.	Remarks.
27,953	400	257	
2,243	100	343	
5,143	100	268	
6,099	300	651	
55,365	500	766.	
974	50	196	
1,438	50	239	
2,661	100	262	
4,653	100	421	
32,199	800	604	
7,119	200	455	
1,903	50	297	
6,091	250	519	
5,355	200	557	
7523	100	346	

Serial no	Name of the Municipality	Population	Income Rs
7	Tiptur	2,531	27,487
8	Turuvekere	2685	5,197
9	Bavagada	2,594	3,014
10	Kunigal	1,405	13,679
	Mysore District		
1	Mysore city	71,306	3,91,392
2	Hunsur	4,559	17,135
3	Chamarajanagar	6,515	16,304
4	Yedatore	1,619	3,231
5	Heggadadevankote	1,346	2,411
6	Gundlupet	4,141	10,503
7	Nanjangud	5,960	58,405
8	T. Narasipur	4,004	4,544
9	Periyapatna	3,308	5,371
10	Bannur	4,491	8140
11	Talkad	4,184	4,675

Expenditure	Amount provided for expenditure in the municipal budget	Amount of contribution at 1000. for a popln of 10,000	Remarks
Rs. 13077	Rs. 500	Rs. 253	
2293	50	269	
1826	50	259	
6349	150	141	
3,35,729	9026	7131	
5937	300	456	
10684	300	652	
2538	100	162	
1273	75	135	
7398	200	414	
54293	1000	696	
3779	150	400	
2606	100	331	
5011	100	449	
3755	75	418	

Serial no	Name of the Municipality	Population	Income Rs
12	Sirumugapala	7,422	12,690
13	Mandya	4,291	2,775
14	Krishnarajpet	2,337	3,242
15	Malavalli	5,416	6,265
16	Nagamangala	3,483	5,220
17	Melkote	2,535	3,085
18	French Rocks	1,860	12,405
19	Lalipram	3148	8,389
20	Maddur	2,210	4,571
	Shimoga District		
1	Shimoga	13,111	1,10,605
2	Kumsi	1,895	4,143
3	Channagiri	4,168	7,829
4	Honnali	1,049	7,430
5	Nyamti	3,062	5,024
6	Shikarpur	4,970	23,064

Expenditure	Amount provided for epidemics in the Municipal budget	Amount of contribution at Rs 1000 per a population of 10000	Remarks
Rs	Rs	Rs	
9903	300	742	
2,138	200	419	
2,197	100	234	
5,048	200	542	
3,160	150	348	
1,952	100	254	
6,610	100	186	
2,019	100	315	
2,705	100	221	
98,966	2,200	1,311	
2,582	50	190	
4,427	90	419	
5,622	120	105	
4109	50	306,	
16,102	100	497	

Serial No	Name of the Municipality	Population	Income
			Rs.
7	Sorab	1,792	2,443
8	Sagar	3,684	19,598
9	Kallurkatte	1,000	3,465
10	Tirthahalli	2,718	25,451
	Hassan District		
1	Hassan	7,461	28,650
2	Alur	988	28,366
3	Belur	2,631	11,514
4	Sakleshpur	804	10,871
5	Arsikere	3,562	23,095
6	Channarayapatna	2,980	6,847
7	Holenarasipur	6862	26,034
8	Arkalgud	5,060	9,088
	Kadur District		
1	Chickmagalur	8,537	1,02,067
2	Tarikere	6,350	55,988

Expenditure	Amount provided for expenditure within Municipal borough	Amount of contribution at the rate of 1 on £ 10,000 of population
£	£	£
2065	50	179
17,070	100	368
3,098	50	100
10,434	900	272
22,545	2,000	746
12553	400	99
6,909	200	263
6,483	400	80
8,920	600	356
5,552	200	298
15,732	800	686
7,770	400	506
45,497	1090	854
13,783	500	635

Serial no	Name of the Municipality	Population	Income
3	Birur	4811	17,910
4	Kadur	2900	19,569
5	Narasimharajapur	1855	5612
6	Koppa	1198	14,823
7	Mudigere	1390	10731
8	Sringeri	2,971	5,676
	Chitaldrug District		
1	Chitaldrug	6,986	1,07,211
2	Davangere	10,074	86,353
3	Harihar	5,408	26,180
4	Holalkere	3,746	8,668
5	Hosdurga	2,176	8,208
6	Hiriyur	2,533	8,168
7	Challakere	2,505	18,615
8	Molakalmuru	3,054	3,828
9	Jagalur	3632	13,527

19/1/19.

Population	Amount provided for epidemics in the Municipal Budget.	Amount of contribution at Rs 1000/- for a population of 10,000.	Remarks
9,156	400	481	
5,972	200	290	
3,503	100	186	
9,927	1400	120	
5,543	100	139	
4,764	125	297	
98,246	1,000	699	
49,886	3,000	1,007	
15,710	1,000	574	
7,186	120	375	
7,143	120	218	
4,775	120	253	
5,384	200	251	
2,793	75	305	
7,491	120	363	

G. R. S. VI—G/321

SUBJECT:.....

.....

.....

Diary No. of letter replied to.....

GENERAL AND REVENUE SECRETARIAT,
( )
the *191*

Date of issue..... 27/2/19

Signed by.....

Section
File No.
Serial No. 5

No. G/18837/20

To,

The Secretaries Govt. of H.H.D.
D.P.H.
Retired Sinking Cooly

Sir,

I am directed to forward herewith 2 Copies of your petition on the subject noted in the margin.

I have the

for Chief Secretary

over.

G. R. S. VI—G/32]

3 of 46 55

SUBJECT.....

.....

.....

Diary No. of letter replied to.....

GENERAL AND REVENUE SECRETARIAT,

( )

, the *191* .

Date of issue..... 27/2/19

Signed by..... M. Dass

Section

File No.

Serial No. 6

No. G/18836

300

To

The Sanitary Commissioner

Sir

In continuation of this office letter No. G 17306 dated the 14th February 19, I am directed to forward herewith 300 Copies of the notification on plague by Dr. H. Srinivasachar for distribution to Sanitary and revenue officers for information.

I have etc.

M. Z. Thackeray

Deputy Secretary

over.

CS

Att

Cy. 2/19

Drafts 56

G. R. S. VI—G/32]

SUBJECT.....

.....

.....

Diary No. of letter replied to.....

Section Gen
File No. 92/18
Serial No. 7

GENERAL AND REVENUE SECRETARIAT,
( )
, *the* 191 .

No. G/18838-9
Over

Date of issue 27/2/09

Signed by M. Ohm

To

The President of the City
Municipal Council of
Bangalore & Jayanagar

Sir,

I am directed to forward herewith a copy of a note on plague in the Jayanagar Station by Dr. McSwiney and to request you to submit brief notes showing the action taken, if any on the following points:—

over.

Read/ Rec

1 To supplement the method of disinfection recommended by Dr. Srinivasa Rao

2. To arrange for a Campaign of rat destruction &

3. The question of framing in Municipal bye-laws for the Construction of rat-proof houses & rat-proof godowns for grains.

2 I am also to request you to furnish information giving statistics of deaths, expenditure under (1) Stall and (2) Local Funds inoculation, plague Hospitals &c since the first outbreak up to July 1918, before and every six months.

3. The matter may be kindly treated as very urgent as the information is required by the 6th.

List of enclosure

Copied by

Examined by

I have the

WD 36—GPB—60,000—15-11-16

6th
21/2

D. M. O.

for Chief Secretary

Please address all future communications to the Comptroller to the Govt. of H. H. the Maharaja of Mysore.
In reply to this Comn. please refer to
No. 2369/Books.

Urgent 58

OFFICE OF THE COMPTROLLER TO THE GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE.

Dated, Bangalore, the 18 Feb. *1919*.

11599

FROM

59296

M. N. KRISHNA RAO, ESQ., B.A.,
~~Offg.~~ *Comptroller to the Government of His Highness the Maharaja of Mysore.*

To

.....C....S...Balasundaram..Iyer....., ESQ., B.A.,
Chief *Secretary to the Government of Mysore,*
.....B..A..N..G..A..L..O..R..E..... ~~Department.~~

SIR,

As requested in your letter No.G.17308 dated 14th February 1919, I have the honor to forward a statement showing the expenditure incurred on account of Plague preventive measures from State Funds since the first out-break up to the end of June 1918.

A separate statement for expenditure incurred by local bodies will be forwarded shortly as far as information is available in this office.

I have the honor to be,
Sir,
Your most obedient servant,

COMPTROLLER.

MSR/18-2.

WD.0322—GPB—3,000—14-12-16

C. O. 42-Rec.—17]

....Department

191

FROM

M. N. KRISHNA RAO, ESQ., B.A.,
Offg. Comptroller to the Govt. of
H. H. the Maharaja of Mysore.

To

.....ESQ.,
Secretary to the Govt. of Mysore,
Dept.

Dated

Despatched

Received

No.....

Subject matter.

59

Statement Showing the Expenditure incurred on account of Plague preventive measures Since the first outbreak upto the end of June 1918.

Year	Expenditure incurred by the State
1896-97	11.428 ✓
1897-98	30.334 ✓
1898-99	7.50.640 ✓
1899-00	4.63.535 ✓
1900-01	2.95.397 ✓
1901-02	1.64.277 ✓
1902-03	1.10.351 ✓
1903-04	1.21.606 ✓
1904-05	1.21.559 ✓
1905-06	1.10.174 ✓
1906-07	81.356 ✓
1907-08	75.219 ✓
1908-09	35.105 ✓
1909-10	44.718 ✓
1910-11	45.904 ✓
1911-12	31.789 ✓
1912-13	26.063 ✓
1913-14	26.695 ✓
1914-15	11.093 ✓
1915-16	7.752 ✓
1916-17	29.273 ✓
1917-18	35.981 ✓

Rs 26,30,249

18.2.19

Comptroller

Urgent

Please address all future communications to the Comptroller to the Govt. of H. H. the Maharaja of Mysore.
In reply to this Comm. please refer to
No. 261/L.A.D. 2/3

GEN. CONFDL. DEPTT.
Ch. Sects
1 FEB 1919

OFFICE OF THE COMPTROLLER TO THE GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE.

Dated, Bangalore, the 21st Feb. *1919*.

11709

FROM

59663 M. N. KRISHNA RAO, ESQ., B.A.,
Offg. Comptroller to the Government of His Highness the Maharaja of Mysore.

To

C. S. Balasundaram Iyer., ESQ., B.A.,
Chief *Secretary to the Government of Mysore,*
Bangalore. ~~Department~~

SIR,

In continuation of my letter No.2369/Books of ~~yesterday~~ 18th instant, I have the honor to forward herewith statements showing the expenditure incurred on account of Plague Preventive Measures from (1) Municipal Funds, (2) District Funds, (3) Kolar Gold Fields Sanitary Board Funds, as far as information is available in this office.

2. It will be seen from the statements that Plague charges have except for the period from 1902-03 to 1909-10 in the case of Municipal Funds, been included under the general head " Plague, Cholera and other epidemic charges."

I have the honor to be,

Sir,

Your most obedient servant,

Comptroller.

MSR/21-2.

Statement showing the Plague Charges incurred by the Municipal Board for 1896-97 to 1917-18.

61

Year.	Head of Debit	Amount	Remarks.
1896-97			No separate head existed in the abstracts to record expenditure relating to Plague charges.
1897-98			
1898-99			
1899-1900			
1900-01			
1901-02			
1902-03	Plague preventive measures	- -	
1903-04	— do —	- -	
1904-05	— do —	425	
1905-06	— do —	85	
1906-07	— do —	66.590	
1907-08	— do —	6381	
1908-09	— do —	13.731	
1909-10	— do —	21.513	
1910-11	Plague Cholera and other Epidemic charges	27.972	
1911-12	— do —	18.516	
1912-13	— do —	11.526	
1913-14	— do —	7.764	
1914-15	— do —	18.741	
1915-16	— do —	18.355	
1916-17	— do —	39957	
1917-18	— do —	?	Accounts are not received in this office from 1.7.1917 and have been taken by Local Auditors for audit.
		251556	

Statement showing the Plague charges incurred by the District Boards from 1896-97 & 1917-18.

52

Year.	Head of Defect.	Amount	Remarks.
1896-97			No registers available.
1897-98			
1898-99			
1899-1900			
1900-01			
1901-02			
1902-03			
1903-04	No separate head	—	
1904-05	Cholera and other Epidemic Charges.	465	
1905-06	—do—	1967	
1906-07	—do—	1283	
1907-08	—do—	1355	
1908-09	—do—	2711	
1909-10	—do—	1954	
1910-11	—do—	3243	
1911-12	—do—	1868	
1912-13	Plague, Cholera and other Epidemic Charges	5736	
1913-14	—do—	4575	
1914-15	—do—	908	
1915-16	—do—	1359	
1916-17	—do—	1542	
1917-18	—do—	2	Accounts are not received in this Office from 1.7.1917 and have been taken by Local Auditors for audit.
		29106	

Statement Showing the Plague charges incurred by the Sanitary Board, K.G.F., from 1896-97 to 1917-18.

Year.	Head of Debit	Amount	Remarks.
1908-09	Cholera and other Epidemic charges	—	The Kolar Gold Fields Sanitary Boards came into existence in 1908-09. Expenditure of Kolar Gold Fields Sanitary Boards is merged in District Boards expenditure from 1908-09 to 1913-14.
1909-10	—do—	—	
1910-11	—do—	—	
1911-12	—do—	—	
1912-13	Plague, Cholera and other Epidemic charges.	—	
1913-14	—do—	—	
1914-15	—do—	5982	
1915-16	—do—	5886	
1916-17	—do—	7075	
1917-18	—do—	?	Accounts are not received in this Office from 1-7-1917 and hence been taken by Local Auditors for audit.
		18893	

Department of Public Health in Mysore. 64

OFFICE OF THE SANITARY COMMISSIONER
WITH THE GOVT. OF MYSORE.

Bangalore, dated the 6th March *1919.*

No. G.C398-4
Enc. 2

1233

From

A. K. PANI, Esq., D.P.H., etc.
Offg. Sanitary Commissioner with the Government of
H. H. the Maharaja of Mysore, BANGALORE.

To

C. S. Balasundaram Iyer, Esq., B.A.,
Chieg Secretary to the Government of Mysore,
Bangalore.

Sir,

W

In reply to your letter No. G. 17306 dated the 14th Ultimo, I have the honour to state that in accordance-with Government Order No. 5730-46 Ml. 16-17-57 dated the 9th April 1918, the Deputy Commissioners of Districts and Presidents of District Boards were requested to place before the several local bodies for consideration certain proposals having for their object the systematization of Plague preventive measures in the state. These proposals related to.

1. the arrangements necessary in order to deal effectively with first cases of rat mortality.

2. the provision of sheds for use as Health and contact camps.

3. the construction of a small Isolation Hospital in all Municipal towns with a population of 5,000 and upwards.

4. Disinfection by desiccation and (5(the proper - - enforcement of existing rules of the Municipal Regulation to secure rat-proof conditions in dwelling houses and shops.

Very Important

G. Secl. Cir

6 [illegible] 191

From The Sanitary Commissioner in Mysore, Bangalore.

6.947

To The Chief Secretary to Govt. Bangalore

Dated 6th March 19.

Despatched

Received

General No. G.e398-4

No.

Enclosure No. 2.

Forwarding Submitting to Govt. a report on the note on Plague by Dr. M. Srinivasa Rao.

Sair 6/3/9

Draft-please to U/S

Comm/r agr = others incurred

Sec/ 6/3

63

As will be seen from Para 10 ofthe copy of the circular enclosed, the local bodies have been informed that a suitable grant-in-aid will, if necessary, be made out of Plague funds.

A statement showing the statistics of deaths from Plague from the commencement of the Epidemic up to the end of June 1918 is submitted herewith, I regret I am not in a position to furnish a statement of expenditure, as no accounts are sent to this office. The Comptroller to Government may be able to furnish the necessary information.

I have now asked the District Sanitary Officers and Health Officers to report to me how ~~for~~ far the recommendations made by the then Sanitary Commissioner are being carried out. They being touring Officers there is some delay in getting replies from them in time. Further, I will be in a better position to report after my visits to the various districts as to how far the recommendations made are effective to combat the disease.

I have the honour to be,

Sir,

Your most obedient servant,

Offg. Sanitary Commissioner.

M.A.N.6-3-19.

No.G.C.434-2 dated 28-5-18 from the Sanitary Commissioner in Mysore to the Presidents, District and Municipal Boards.

Under instructions from Government conveyed in their order No.5730-46 Ml 16-17-57, dated, 9th April 1918, I have the honor to detail hereunder the most important among the preventive measures that should be adopted against Plague and to request that necessary action may kindly be taken to have facilities provided in every local area in your district, at as early a date as possible.

2. As has on several occasions been brought to your notice the essential requirement for success in plague prevention is a state of preparedness to deal with first cases of rat mortality. This presupposes that the local body responsible for plague measures can be sure of getting prompt reports of the occurrence of rat mortality. It is not possible to enforce by legislation, the reporting of the appearance of dead rats in any house of locality and all the efforts of the Board must be directed to educate people to a sense of their responsibility in this matter. There should be a free distribution of leaflet showing the importance of a dead rat being properly disposed of and the whole house being thoroughly disinfected. The people are afraid of being compelled to evacuate their villages for prolong periods if the appearnace of dead rats is reported to the authorities. This fear should be dispelled by popular lectures in kannada and by informal talks on the subject whenever the Sanitary and Executive Officers meet the people. The Sanitary Inspectors and the conservancy staff in the Municipalities may be asked to report all cases in which dead rats have been thrown into the streets . The houses in such street may be evacuated and disinfected.

3. The item next in importance is the provision of sheds for use as a Health and Contact Camps. It is not possible

to

67

to fix the number of such sheds but they may be as many as the financial condition of the local body will allow and according as plague is or is not an annual visitor and also in proportion to the population of the local area. Typed designs are herewith forwarded with estimates. It would be desirable that the sheds are substantially built and properly looked after to prevent deterioration.

4. Whenever dead rats are observed in any house the inmates of the house and of the neighbouring houses should be asked to vacate them and remove to the sheds with all their belongings. The period of the occupation of sheds by any one family should not exceed ten days. During this period of their temporary stay in the sheds, their own houses ought to be subjected to a course of thorough disinfection. As soon as disinfection is over, the people must be compelled to go back to their own houses.

5. All municipal towns with a population of 5000 and upwards should have a small isolation hospital located preferably in as close a proximity as possible to the dispensary. Here again the number of beds in the isolation hospital depends upon the population. If during a severe epidemic more cases come in than can be accommodated in the Isolation Hospital, temporary sheds may be put up to meet the emergency. For a small place a ward to accommodate 4 beds is likely to be found sufficient.

6. The local Medical Officer will ordinarily be in charge of the Isolation Hospital but if special occasions demand it the services of an additonal Sub Assistant Surgeon might be obtained temporarily from the Medical Department.

7. As regards disinfection the procedure in vogue - to defer the measure to the very last, until the houses are about to be reoccupied after evacuation, should be discontinued. When it is remembered that it is the infected rat flea that is almost always responsible for the spread of plague and that to kill the flea is a very easy matter, requiring only the application of dry heat in the infected area, the danger of not resorting to disinfection without undue loss of time will be

and evident.

Disinfection by desiccation should be carried out immediately after the evcuation of the house and repeated once again before reoccupation if it is kept ~~of~~ vacant for more than 10 days. The house so disinfected is, provided no further dead rats are seen in it, fit for reoccupation any time after the disinfection and subsequent cleansing processes are completed. The Malaria material for desiccation may be paddy straw, dried leaves or in fact anything that easily catches fire. Paddy straw should be spread evenly all over the floor in the house and then set fire to. It is of course best that trained staff is employed to carry out the disinfection, for then we could be sure of the efficacy of the process. For this purpose 2 or 3 men attached to the permanent staff may be trained in disinfection work. During seasons of plague the men may be employed for disinfection duty their ordinary work being otherwise temporarily provided for. While employed on plague duty the men may be given a special allowance of Rs.5/- per mensem. This arrangement obviates the necessity of maintaining a disinfection establishment through out the year. If necessary a temporary gang of men may be employed on daily wages.

8. About inoculation it is not necessary to say much, as its efficacy in confirming immunity against plague is well known. A special Inoculating Officer will as far as possible be made available at the request of the local body concerned.

9. Summing up, the requirements that every local body should provide for are as follows :-

1. Equipment permanent

   (a) Sheds for use as Health & Contact Camp

   (b) Isolation ward with necessary equipment

11. Recurring charges

   (a) One watchman for the sheds (permanent)

   (b) A disinfection gang

   (c) One attendant for the Isolation ward

   (d) Cost of medicine and other contingencies.

10. I request that the subject may kindly be placed before

69

before the several local bodies for consideration. If estimates of the initial and recurring expenditure which the local body resolve to incur is furnished to me, I shall be glad to submit them, with recommendation, in case of necessity, for a grant-in-aid towards meeting the cost being sanctioned out of plague funds.

11. In conclusion I may say that the trend of the Municipal policy in the matter should be the formation of extensions in the proper enforcement of existing rules of the Municipal Regulation to secure rat proof conditions in dwelling houses and shops. Action should also be taken to prevent stocking of grain in shops except under effective precautions to prevent the access and habouring of ~~rates~~ rats.

---oo0oo---

" Copy "

Offg. Sanitary Commissioner.

Statement showing the number of attacks and deaths from Plague in the State of Mysore from 1898-99 to 1917-18.

Years.	Attacks	Deaths
1898-99	14831	12272
1899-00	6596	5001
1900-01	17959	13573
1901-02	21976	16083
1902-03	36088	26573
1903-04	26851	19972
1904-05	24370	17488
1905-06	3033	2138
1906-07	5983	4287
1907-08	19275	14059
1908-09	6339	4464
1909-10	5182	3688
1910-11	12697	8886
1911-12	18767	14041
1912-13	5361	3782
1913-14	4782	3322
1914-15	7021	4789
1915-16	5466	3808
1916-17	16552	11755
1917-18	13955	9859
Total	2,73,084	1,99,840

Office of the Sanitary Commissioner for Mysore.
Bangalore 6th March 19

A.K. Rau
Offg: Sanitary Commissioner

No 261/2000

OFFICE OF THE CITY MUNICIPAL COUNCIL,

Bangalore City, dated 10th March 1919

71

1126 55

From

DEWAN BAHADUR, RAJA SABHA BHUSHANA
K. P. PUTTANNA CHETTY, ESQ., C.I.E.,
Honorary President, City Municipal Council,
BANGALORE CITY.

Ch Secy
11 MAR 1919

92-18-11

61325

To

C.S.Balasundaram Iyer, Esqr., B.A.,
Chief Secretary to the Government of
His Highness the Maharaja of Mysore,
Bangalore.

Sir,

Referring to your letter No.G.18838-9 dated 27th February 1919 calling for certain information on the Note on Plague by Dr.M. Srinivasa Rao, I have the honor to forward herewith copy of a Memo No.1308 dated 6th Instant submitted by the Health Officer explaining briefly the action taken in combating plague.

2. A statement shewing the number of attacks and deaths due to plague ever sine its advent into Bangalore City , and the expenditure incurred on that account is also forwarded. The figures under "Expenditure" are given begining with 1903-1904, as those relating to previous years are not available in this Office, the cost having been met from State Funds by the Plague Department.

3. Eminent authorities seem to differ as to the practicability of a campaign of rat destruction which will have an appreciable effec on the course of plague. In a City like Bangalore, the efficacy of such a campaign is open to serious doubt.

4. Some rat proof arrangement may be insisted on in the case of future constructions of houses and godowns, but legislation will be necessary.

I have the honor to be,
Sir,
Your most obedient servant,

Honorary President.

From

To

Dated

Despatched

Received

General No. _____
No.

Enclosure No.

Memo No.1308 dated 7th March 1919, from the Health Officer Bangalore City, to the Honorary President. City Municipal Council, Bangalore.

*****

Referring to Chief Secretary's No.G.18838 dated 1st March 1919, received with Memo No.526 dated 1st Instant calling for brief notes regarding the action taken in connection with plague in the Mysore State, I have the honor to submit as follows:-

I. As may be seen in the printed note received as an enclosure to the above, the process of disinfection has undergone during the long interval of 21 years, several stages of development with the advance of scientific knowledge. The methods of disinfection now being generally adopted are fumigation by burning neem leaves and desiccation of a simple type which consists in a thin layer of paddy straw or dried leaves which will easily catch fire being spread all over the floor in the infected house and set fire to. The burning process being over the house will be thoroughly disinfected by Kerosine Oil emulsion, besides drains in the said premises being flushed with phenyle solution.

Disinfection is being undertaken by a specially trained staff maintained for the purpose free of cost. Whenever a rat fall or case of plague is reported or suspected, immediately instructions will be issued to have the premises disinfected. The work will be supervised by the Inspectors of Divisions.

II. Regarding the suggested campaign of rat destruction the records in the Office show that the system of rat destruction was tried for several years prior to 1911 at great expense when Government in their Proceedings No.2555-95/San.26-10-17, dated 11th October 1911 ordered its discontinuance as the measure was found to be inadequate to fulfil its expectations. Consequently the campaign of rat destruction at Government expense was put a stop to.

But as also enjoined in the above Government Order every opportunity is being availed of to instruct people to spare no private efforts to minimise rat population by setting traps in their houses. This is being resorted to by large numbers.

72

III. Regarding the construction of rat proof houses and rat proof godowns for grains, legislation is necessary and in this matter necessary Municipal Bye-laws will be framed in due course.

IV. A statement showing statistics of plague attacks and deaths since 1898-99 to 1917-18 is appended for kind perusal together with expenditure incurred in connection therewith so far as available here.

/sd/ F Fernandes -
Health Officer.

" COPY "

W W Matthewman Peet
Honorary President.

ws.

STATEMENT SHOWING THE NUMBER OF PLAGUE ATTACKS AND DEATHS IN CITY OF BANGALORE SINCE 1898-99 to 1917-18.

74

******

Years	Plague.		Expenditure.	Inoculation.	Remarks.
	Attacks	Deaths.			
1898-99	3831	3656	X		X
1899-00	629	516			To be obtained from the Comptroller's Office
1900-01	2420	2281			
1901-02	1736	1689			
1902-03	2020	1861			
1903-04	2258	1783	Rs. 8679/-		
1904-05	1048	818	" 6412/-		
1905-06	559	405	" 8146/-		
1906-07	612	478	" 8295/-		
1907-08	1327	922	" 5836/-		
1908-09	246	185	" 12783/-	257	
1909-10	128	97	" 17740/-	6435	
1910-11	781	612	" 22911/-	8582	
1911-12	288	210	" 10218/-	586	
1912-13	507	385	" 9254/-	495	
1913-14	79	53	" 7979/-	55	
1914-15	350	235	" 12589/-	1099	
1915-16	53	42	" 9865/-	79	
1916-17	912	709	" 25884/-	12859	
1917-18	223	155	" 13379/-	1141	
Total	20007	17092	17997.0		

Sd/ F.Fernandes
Health Officer.

" COPY "

Honorary President.

wj

No. 165
Enc. 2.

OFFICE OF THE PRESIDENT,
CITY MUNICIPAL COUNCIL, MYSORE.

Dated 13th March. *1919*

75

No 12985

7. No 92-18-12

SECRETARIAT, JUDGT.
15 MAR 1919

FROM,

RAJASABHABHUSHANA DIWAN BAHADUR,

C. SRIKANTESVARA AIYAR, B.A, B.L.,

PRESIDENT, CITY MUNICIPAL COUNCIL,

MYSORE.

To, C. S. Balasundaram Iyer, Esquire., B.A.,

Chief Secretary, to the Government of His Highness the Maharaja of Mysore.

Jan 15/3/19 a 35

Mysore

Pm 15/3

SIR,

With reference to your No. G. 18839 dated 27th February 1919 forwarding a copy of a note on plague in the Mysore State by Dr. M. Srinivasa Rao and requesting to furnish, by the end of the month, brief notes showing the action taken on certain antiplague measures referred to in the note, I have the honour to state as follows : -

2. Disinfection by Dessication :- This has all along been resorted to and will be tried wherever practicable. It however does not promise to fulfil the high hopes held out for it; because -

(a) It is not always possible to deal with every part of an average Indian house. Very often even the whole of one room cannot be dessicated. The construction of the house and the habit of storing in it anywhere and everywhere in a most disorderly fashion all sorts of odds and ends, do not render it easy to dessicate.

(b) Dessication may destory a few fleas hopping about the floor of a room at the time; it does not kill all the fleas. For one flea killed there are hundred others on rats, lurking in rat burrows, roofs and amongst lumber. When the house is

is reoccupied these rats return and the conditions become just the same after dessication as before it. Only the occupant will be under a false sense of security that he is safe after dessication which the authorities advised for his house.

Dessication therefore possesses no advantages over the old fashioned disinfection by kerosine oil emulsion or neem leaf fumigation.

As a matter of fact experience has shown none of these methods of disinfection can be considered efficient.

Rat Destruction - This certainly is the measure against plague. But it would mean keeping up a continuous campaign at an enormous cost. For the City of Mysore for example this measure may cost about Rs. 10,000 to Rs. 15,000 a year. The City Municipality is too poor to undertake any such heavy recurring expenditure. If the Government however are pleased to sanction funds for say five years, this measure of rat campaign will be given a fair trial.

Construction of rat proof houses and go-downs - In theory this sounds very well. It is doubtful if mere rat proof construction of houses and go-downs would really keep rats out. Sometime ago in Bombay the plague commission built a couple of rat proof chawls under their supervision. They were afterwards let and periodically visited by the authorities to see for rats. After the lapse of a year or so hundreds of rats were found in these rat proof chawls. I have personally witnessed these chawls.

There are many Government pukka built offices and houses in Mysore which swarm with rats.

It is not mere construction of rat proof houses and go-downs that would keep them free from rats, but it is more the way they are looked after.

77

However, house building licenses contain conditions, particularly if the houses are of some value, to build them rat proof.

3. The enclosed statement shows the attacks and deaths from plague and the expenditure under State and Local funds, since October 1898 up to end of June 1918. In the early days of plague, practically the whole of the plague charges were from State Funds. In latter years, i.e. from 1908 - 1909, the expenditure was gradually reduced and it was shared equally between the Government and the Local bodies.

4. The details called for under inoculation, plague hospitals &c., are not available separately, but the various years records have to be looked into and the details tabulated, which unfortunately will take some time. and will be submitted as soon as practicable.

I have the honour to be,

Sir,

Your most obedient servant,

President.

MRV.

Statement A.

Statement showing the Attacks and Deaths in connection with Plague from 1st October 1898 to the end of June 1918.

Attacks.	Deaths
31,204	23,989

President,
City Municipal Council, Mysore.

Statement B.

79

Statement showing the amount spent in connection with Plague from 1st October 1898 to the end of June 1918.

Official years.	Plague Funds.			Municipal Funds.		
	Rs.	A.	P.	Rs.	A.	P.
1898-1899	93,869	12	10	...		
1899-1900	54,703	5	2	...		
1900-1901	98,399	9	7	...		
1901-1902	48,617	1	7	...		
1902-1903	29,582	15	7	...		
1903-1904	14,268	8	11	...		
1904-1905	38,339	6	2	...		
1905-1906	42,835	11	1	...		
1906-1907	26,209	8	10	...		
1907-1908	15,736	3	1	...		
1908-1909	2,236	3	10	1,100	0	0
1909-1910	1,806	8	0	1,806	8	0
1910-1911	1,872	0	0	1,872	0	0
1911-1912	3,617	8	0	3,617	8	0
1912-1913	1,709	0	0	1,709	0	0
1913-1914	2,009	0	0	2,009	0	0
1914-1915	2,593	0	0	2,593	0	0
1915-1916	3,341	8	0	3,341	8	0
1916-1917	5,071	0	0	5,071	0	0
1917-1918	3,812	8	0	3,812	8	0
Total	4,90,630	6	8	26,932	0	0
Grand Total	5,17,562	6	8			

Tarapore
Sd/- Sabnis

Substitute for the penultimate paragraph.

To ensure that disinfection is effectively carried out it is desirable to entrust this work to a trained staff. For this purpose a few men attached to the permanent conservancy staff in each place should be trained in the technique of disinfection so that they may be employed on disinfection work whenever necessary, their places being taken temporarily by men to be newly engaged. Similar training should be given through Sanitary Inspectors to a few village servants in all important villages. When the number of affected villages is large, an itinerant gang may also be temporarily employed to practically demonstrate the method of disinfection to the villages under the supervision of the Sanitary Inspectors. These arrangements will obviate the necessity of maintaining a

P.T.O.

G. R. S. VI—G/32]

SUBJECT 1516

Diary No. of letter replied to.....

Section San
File No. 92-18
Serial No. 13

GENERAL AND REVENUE SECRETARIAT,
( )
, *the* 191

No. G26723 one

Date of issue 28/5/19

Signed by W. Pace

To

A. K. Pani, Esq. O.P.S.
Offg. Sanitary Comr. in Mysore

Dear Sir,

In forwarding herewith the draft of an order which Govt. propose to issue for systematising Malaria Preventive measures in the State I am desired to request You to kindly forward Your opinion on the same @ a very early date. The draft may also be returned along with the reply.

Yours faithfully

over

28/5/19

W. 2525

Nos.

General and Revenue Secretariat

Bangalore, dated

803

Resolution.

His Highness' Government have had under their consideration for some time past proposals for the systematisation of plague preventive measures in the State, and for the adoption of more effective measures to minimise the ravages of ~~plague.~~ the disease

2. On the eve of his retirement, Dr. Srinivasa Rao, Sanitary Commissioner, was requested to review ~~20 years~~ plague administration in the State and to favour Government with a short note based on his experience on the preventive measures to be adopted in the State. His note is printed in extenso as appendix I.

3. An attempt is here made to review the progress made in the several anti-plague measures adopted and to suggest a comprehensive method of dealing effectively with the epidemic.

Outbreaks of Plague.

4. The first case of plague occurred in Bangalore on the 12th August 1898. In the first epidemic, Bangalore, Kolar and ~~Shimoga~~ Districts were most affected Since then, plague has spread to all the Districts.

Statistics of attacks and deaths.

5. The total number of plague attacks and deaths since the 1st outbreak in 1898 up to end of 1917-18 is 2,73,084 and 1,99,840 respectively. Expressed in ratios per 1,000 of the mean population,

population, the plague mortality rate for the whole period amounts to 39.21 or a mean annual rate of 2.

6. The severest epidemics were in the years 1902, 1903 and1904 with 26.301, 20.223 and 21.662 deaths respectively.

7. The annual incidence of plague has shown a lesser degree of variability in Mysore than elsewhere.

8. The annual death rate has varied from 5.37 in 1902-1903 to 0.67 in 1905-06. The disease has been found to assume its highest virulence in the month of October and subsides generally in the month of May.

9. Plague extorts a considerably greater toll of the urbun population than it does of the rural, partly because there are greater facilities for prompt evacuation in villages than in cities and towns. The greater congestion in towns and the more favourable conditions for quick dissemination of infection through rats may also account for the higher mortality in towns.

10. The disease appears constantly in certain seasons of the year. There are signs that the disease is decreasing in virulence and hence the decrease possibly may be due to the increasing degree of immunity to plague of the rat population. Dr. Srinivasa Rao considers that plague stands a good chance of dying out in course of time when the rats acquire complete immunity to the plague bacilli. When infected rat fleas are present in any locality, an epizootic among rats, if it does start, varies in severity and rate of progress according to the season of the year, climatic

85

climatic conditions, the number of susceptible rats and the number of fleas on each rat.

11. The season of the annual prevalence of plague - if it does break out in a town or a village - is constant. A comparison of the quinquennial averages of the figures of the plague mortality in the State reveals a gradual deminution in the intensity of the disease, which is perhaps to some extent accounted for by the immunity against plague acquired by rats and man as years go by.

Repetition of last para in sense

12. Dr. Srinivasa Rao states that a mean temperature between 70 degrees and 80 degrees Fahrenheit, associated with a saturation deficiency less than 0.30 inch, is a condition that favours the outbreak and spread of plague. The disease is said to rapidly subside whem the mean temperature is in excess of 80 degrees Fahrenheit combined with a high saturation deficiency.

Measures taken to check the spread of plague.

13. At first the Government of Mysore resorted to the following measures to check the spread of the disease :-

(1) Detention and observation of persons coming from infected areas.
(2) Compulsory removal of plague patients to special hospitals.
(3) Compulsory isolation of those that came into contact with plague patients.
(4) Disinfection of infected houses and localities.
(5) Inoculation with plague vaccine of those that were exposed to infection.

14. As the compulsory segregation of patients and contacts and compulsory disinfection of effects were found to retard rather than to forward preventive operations by rousing popular resentment, they were given up after a short trial.

86

Anti-plague measures now in vogue.

15. The anti plague measures in vogue at present are :-

for on the occurrence of the first cases of plague

(1) Evacuation of houses after rat fall ~~and~~
(2) Disinfection.
(3) Inoculation of persons exposed to infection and in the infected locality.

Evacuation, as at present attempted, is not thorough and is not done at the proper moment.

16. Various methods of disinfection were practised, disinfection of soil by all sorts of chemical disinfectants such as corrosive sublimate, phenyle and its congeners, disinfection by emulsion of kerosine oil or pesterine in soap solution and disinfection by heat and fumigation by burning neem leaves.

17. As regards disinfection the procedure in vogue is to defer it to the very last until the houses are about to be reoccupied after a period of evacuation.

18. Inoculation has been slowly making its way against much opposition. Inoculation work is now carried on by the medical officers and by the Health and District Sanitary officers. In Bangalore, a lady Assistant Surgeon is deputed for inoculating gosha ladies.

19. Anti plague measures recommended for adoption.

The anti plague measures recommended for adoption are :-

(1) Evacuation.
(2) Disinfection.
(3) Inoculation.
(4) Dissociation of man from rats.

(a) regular compaign of rat destruction in small towns and villages.
(b) construction of rat proof houses ~~and~~ godowns and markets and keeping them in a rat proof condition in larger cities like Bangalore and Mysore.

People

87

20. People should be educated by means of lectures and pamplets, to a sense of their civic responsibility, to give prompt reports to the authorities concerned of the occurrence of rat mortality, to properly dispose of the dead rat and get their houses thoroughly disinfected.

21. Evacuation should be thorough and should be undertaken at the earliest moment immediately after the discovery of an infected dead rat or upon the occurrence of the first case of plague.

22. Disinfection by dessication in a simple form has been advocated during the past 2 years and should be rigorously practised by all. Disinfection by dessication should be carried out immediately after the evacuation of the house and repeated once again before reoccupation, if it is vacant for more than 10 days. All grains in which rat flees are found should be exposed to bright sun light for at least a couple of hours. If notwithstanding disinfection, a wholesale evacuation of a town or a village is desired by the people it should be actively proceeded with, the necessary facilities in the shape of supply of shed materials gratis or at cost price being provided. Once a town or a village is evacuated people should be dissuaded from opening and visiting the houses for any reason whatever unless it is for reoccupation. A thorough dessication of the house should be insisted upon prior to reoccupation. In houses in which a dead rat has been seen, all articles in the houses should

88 Straw

should be removed and a thin layer of paddy ~~straw~~ or dried leaves or other inflammable material - should be uniformly spread all over the house and ~~xxxxxxxx~~ set fire to.

21. To facilitate prompt evacuation ~~and immediate dessication,~~ arrangement should be made in every municipality for the construction of sheds according to approved designs, the number of such sheds depending upon the population of the municipality and the frequency and prevelance of the epidemic. Approved type designs have been forwarded with estimates to the President of the District Boards, and Municipal Councils. These sheds should be used as :-

(1) Health camps, for people removing from the neighbourhood of plague infected houses or localities.
(2) Contact sheds for the temporary occupation of the people required to vacate their own houses for disinfection purposes on account of rat falls or deaths from plague
(3) Isolation wards for the regulation and treatment of the sick.

The sheds should be substantially built and properly looked after to prevent deterioration. If necessary the municipalities and local officers may supply the straw free to poor people.

22. As between continued residence after dessication and evacuation, the latter has been found by far the more effective way of avoiding the disease as disinfection by dessication is likely to be imperfect for many reasons, such as the ~~process~~ disinfection being badly carried out or fresh deaths among rats ailing at the time of dessication but not killed by it setting free a new batch of infected fleas.

23. Evacuation to be productive of the best results should last for not less than eight weeks.

P 24 Government are pleased to note that the effectiveness of inoculation is more and more widely appreciated and availed of by the people. To obtain full benefit from inoculation it should be resorted

resorted to when the epidemic is in its incipient stage instead of when it is at its height as is the tendency at present. The following statement gives the number of people inoculated during the past 5 years and the incidence of plague mortality amongst them:

Period.	Number of persons inoculated.	Attacks among - inoculated.	Deaths among inoculated.	Total attacks.	Total - Deaths.
1913-14	9,473	15	-	4,788	3,322
1914-15	21,308	13	2	7,021	4,789
1915-16	23,405	6	4	5,466	3,808
1916-17	93,931	51	20	16,552	11,755
1917-18	49,799	8	4	13,955	9,859

25. As plague is a disease of rats, inoculation and evacuation which are intended to afford protection to the human population do not strike at the root of the evil. The real anti-plague - measure is the dissociation of man from rats.

26. In the case of small towns and villages a regular campaign of rat destruction should be undertaken in the off season i.e., in the months of April, May and June by the use of rat traps on an extensive scale and by the use of baits contaning barium carbonate. The way to do it has thus been described :-

~~26.~~ 27. One pound of powdered native barium carbonate is mixed thoroughly in an enamled basin with three pounds of flour made from the grain which constitutes the staple food of the locality in which operations are to be carried out. Sufficient water is added to make the whole into a fairly firm paste. The resulting mass is sufficient for some 2,400 baits, each containing three grains of poison, which are conveniently rolled into pill form. Clean hands and dishes are necessary to avoid imparting to the baits extraneous taste and odour which may - diminish their attractiveness. Baits should be

90

be made fresh each day as a hard ~~xxxix~~ stale bait ~~xx x xxxx~~ is rarely eaten by rat.

~~27.~~ "Poison baits made in the manner described should be laid in the evening, four baits on a small piece of paper being placed in situations readily accessible to rats but not so readily accessible to children and domestic animals. - Twelve baits, three groups, will be found generally sufficient for an average sized Indian room. A careful record of the baits set should be kept and in the morning all unconsumed baits should be collected and destroyed, note being made of ~~a~~ the number consumed wholly or in part and the dead rats found should be counted and destroyed. This process can be repeated daily - until no more baits are consumed. Another baiting of the village or ~~a~~ town can be carried out ~~from~~ some two weeks later. When baiting is being carried out special efforts should be made to encourage house-holders to keep all other available food for rats covered up especially at night. In laying baits the presence of rat holes or other indications of ~~a~~ the presence of rats will afford useful indications as to where baits can be laid with most chance of success.

~~28~~. "If rat poisoning be carried out with careful attention to all these details, a very notable degree of success will be achieved with very appreciable benefit when plague threatens."

29. A memorandum has issued inviting the attention of the public to the importance of rat destruction in their houses.

~~26~~ Anti-rat measures directed towards the eradication of plague infection can be prosecuted with a fair chance of success in the hot dry months when plague rats and fleas of infection are fewest. The relatively plague free season

season should synchronise with maximum anti-plague effort and not be regarded as a suitable time for cessation of anti-plague measures. If the measures are half ~~heartedly~~ heartedly carried out the results will be disappointing. A sustained effort is therefore necessary. People should be advised to undertake this work themselves. In particular localities, Government may make arrangements but as a rule the people should be able to do this for themselves instead of waiting for Government to help them.

29. In larger cities like Bangalore and Mysore, arrangements should be made for the construction of rat-proof houses and for keeping them in a rat free condition.

32. With a view to minimise the ravages of plague, Government expect every Municipality to frame suitable municipal bye-laws to insist on the rat proofing of every house, shop, ~~godowns~~ godown and market with the special object of keeping rat infestation at a minimum.

33. Even in "kutcha" buildings something may be done towards eliminating the rat. All measures that lessen the amount of food and shelter for rats automatically effect a reduction in the number of rats.. Protection of stores of food from the depredation of rats and efficient scavenging, being anti-plague measures of the first importance are recommended.

34. Action should be taken to prevent stocking of grains in shops except under effective precautions, to prevent the harbouring and access of rats.

35 In the Government of India's letter dated 18th April 1918, it is stated that "at a recent informal meeting of Sanitary Commissioners in Delhi, a recommendation was put forward that the storage of grain might be declared a dangerous trade in municipalities situated in plague infected and plague threatened districts". It adds "It will be for the local governments to consider whether any steps in the direction suggested can be made and to initiate such arrangements as they think advisable even if these may in some cases involve legislation." The Presidents of Municipal Councils of Bangalore ~~xxx~~ Mysore, Tiptur, Tumkur, Davangere and other important grain centers are requested to go into this question and favour Government with their ~~xxxx~~ views in the matter through the Sanitary Commissioner.

36. Steps should be taken to see that the goods sheds are made rat-proof and subjected to the periodical clearance of rats.

37. ~~35.~~ To diminish the ~~risk~~ of conveyance of plague infection through the medium of grain and similar merchandise, the Sanitary Commissioner with the Government of India suggests the diminition of facilities, at present existing, for rats to enter goods waggons and carts, the breaking of bulk of consignments of grain, the erection of pucca platforms on which grain received loose can be bagged. The ~~xxx~~ Secretary to Government, Railway Department, is requested to submit in consultation with the Railway Companies, proposals for carrying

ing

carrying out the suggestions made by the Sanitary Commissioner with the Government of India.

38 Government recommend for adoption the following suggestions made by the Sanitary Commissioner with the Government of India regarding grain storage:-

"(1) Wherever possible the whole-sale storage of grain should be effected in buildings apart from those in which retail trade is carried.

(2) Wholesale grain stores should not be situated in close proximity to densely-crowded areas of a city.

(3) Wholesale grain stores should never be utilised for purposes of human habitation.

(4) Bearing in mind that water is essential for the life of the rat, no water accessible to rats, or fresh vegetables should be allowed in - wholesale grain stores.

(5) As rats are unable to circumvent a a smooth horizontal projection of nine inches, such a ledge surrounding a grain stores on the top of a plinth 3 feet high is effective in prohibiting the ingress of rats. On the sides of the building in which the doors are situated, this ledge can conveniently be enlarged into a - platform 2 feet or 2 feet 6 inches in width. Reinforcement concrete is a suitable material for such ledges and platforms.

(6) The roof of the godowns should overhang this platform and ledge to prevent the accumulation of rain water therein.

(7) No steps or similar means of facilitating ingress should be allowed. In practice the inconvenience - - caused by the absence of such steps will be found inconsiderable. For unloading sacks of grain designed for such a store the bullock cart can be pushed close to the platform, which is also at a convenient height to facilitate the deposit - thereon of sacks from a cooly's - back.

(8) Rats will, from time to time, be introduced into such a store, but they will be compelled to leave in search of water and should find their return extremely difficult.

(9) In villages and places where the cost of such pucca buildings is prohibitive, relatively rat-free stores can be made of almost any material providing the roof is water tight, by raising the floor on the uprights surmounted by rat-guards similar in design to those commonly employed on ship's cables. These uprights should be at least three feet high and would support the beams on which the floor rests. The floor might be made of wood. The space underneath the floor can be left open and kept free from weeds and rank-growth with but little trouble.

Plague Hospitals Health Camps, contact Sheds &c.

39. There are at present three plague hospitals in the State, one at Bangalore, another at Mysore and the third at the Kolar Gold Fields. The number of patients admitted into these institutions during the past five years were:-

	Bangalore.	Mysore.	Kolar Gold Fields.
1913-14	52	19	70
1914-15	175	131	206
1915-16	17	7	8
1916-17	343	48	329
1917-18	128	13	3

Government have under active consideration proposals for making these institutions more useful. The construction of a new Epidemic Diseases Hosptial in Bangalore ~~at a cost of Rs. 75,000/- has been sanctioned.~~ is under the consideration of Govt.

40 Health and Contact Camps have been provided in the cities of Bangalore and Mysore All municipal towns with a population of 5000 and upwards should have a small isolation hospital in charge of the local medical officer, with about half a dozen beds located as close to the dispensary as possible. The isolation wards should be furnished with cots, beddings, clothing and other equipment.

Government.

95

41 Government hope that people will make more use of the facilities usually provided for evacuation viz., supply of bamboos from the Forest Department free to the poor & at cost price to others in villages where hutting materials are not easily available.

42 The Sanitary Commissinner in consultation with the Deputy Commissioners is requested to select suitable sites for camping grounds in towns and important villages and arrange for water supply &c.,

Statistics of Expenditure.

43 The total expenditure incurred from 1896-97 up 1917-18, on account of plague preventive measures according to the Comptroller's account is Rs.29,29,804.

Amount spent from	Rs.
State Funds...	26,30,249
Municipal " ..	2,51,556
District Funds..	29,106
Sanitary Board..	18,893
K.G.F.	
Total Rs.	29,29,804.

44 The Amildar, or the Deputy Amildar, is provided with a permanent advance of Rs.50/- for expenditure under epidemic charges the advance being recouped from time to time.

45 The municipalities have been asked to make a provision of Rs.1,000/- for every 10,000 of population, for epidemic charges in their budgets.

46 In case of the avilable grant in the budget being found inadequate the municipal Council may apply to Government for special grant-in-aid throught the Sanitary Commissioner

47 The Municipal Councils of Bangalore

and

and Mysore are given half their ~~plague~~ Expenditure on epidemics from State Funds.

48. The Sanitary Commissioner is requested to submit to Government, at an early date, in consultation with the officers and local bodies concerned a detailed statement showing the distribution of expenditure (out of the State ~~grant~~ grants ~~or~~ and contributions for ~~proper one~~ higher or other epidemic charges) for plague prevention, disinfection and inoculation by

(1). Public Health Department, and
(2) Municipalities and District Boards.

He should also submit to Government a forecast of the expenditure to be incurred both during 1919-20 and for the next five years.

Establishment.

49. The only permanent or quasi-permanent establishment on any considerable scale maintained throughout the year partly from plague and partly from municipal funds was that for disinfection for two cities and for the special work in connection with the frontier plague protection scheme in the districts.

50. Small establishments for varying temporary periods are entertained whenever necessary for attending on plague patients, for disinfection of houses &c.,

51. The Deputy Commissioners have been authorised to incur an expenditure of Rs. 50/- per mensem for temporary establishment for disinfection work. To ensure that disinfection is effectively carried out it is desirable to entrust the work of disinfection by dessication to a trained staff, ~~be entrusted~~. For this purpose, 2 or 3 men ~~xx~~ attached to the permanent conservancy staff in the

97

the Taluks as well as in the Municipalities may be trained in the technique of disinfection so that they may be deputed for preventive duty, their places being taken by the temporary gang newly employed. Similar training should be given through Sanitary Inspectors to a few local men in all important villages. In the case of affected villages an itinerant gang may be employed during seasons of plague to practically demonstrate the method to the villagers. While employed on plague duty, they may be given a special allowance of Rs.5/- per mensem. This obviate the necessity of maintaining a disinfection establishment throughout the year. If necessary a temporary gang of men may be employed o daily wages.

52 Every local body should provide for the following:-

Equipment Permanent.

(1) Sheds for use as Health and Contact Camps.
(2) Isolation ward with necessary equipments.

Recurring charges.

(1) One watchman for the sheds (permanent)
(2) a disinfection gang.
(3) one attendant for the Isolation ward.
(4) cost of medicines and other contingencies).

Government will be prepared to sanction a grant-in-aid to the local bodies to meet the cost from plague funds.

Conclusion. 53 His Highness's Government are confident that the measures now recommended constitute a great step forward in the endeavours to successfully combat ~~in~~ plague in the State and trust that with the introduction of local self Government scheme and the re-organisation of the Sanitary Department, these measures will bemore effectively pursued in future.

quote in bgalore

54 Ordered Ordered that a copy of this resolution be communicated to -

The Sanitary Commissioner in Mysore.

The Senior Surgeon in Mysore.
The Comptroller, Mysore Government.
The Revenue Commissioner in Mysore.
The Deputy Commissioners of Districts.
The Presidents of District Boards.
The Deputy Commissioners for communication to the Presidents of Municipal Councils.
The Presidents of the City Municipal Councils of Bangalore and Mysore.
The President, Sanitary Board, K.G.F.
The President of the Sringeri Municipality through the Deputy Commissioner, Kadur District.

55. Ordered also that a copy be published in the Gazette for general information.

Chief Secretary to Government.

579.

Office of the Sanitary Commissioner with the Government of Mysore,

D. O. No. G. C. 503-2
1 file

Fit — No.

Dated Bangalore 8 July 1919.

Cer. 92-18-14

Dear Sir,

With reference to your D. O. letter No.G. 26,723 San. 92-18-13 dated the 28th May 1919, I submit a note embodying my opinion on the draft order proposed to be issued for systematising Plague preventive measures in the State. The draft is herewith returned as desired.

Yours Sincerely,

A. R. Rau

To

C. S. Balasundaram Iyer, Esq., B.A.,
Chief Secretary to Government,
Bangalore.

N O T E.

100

Paragraph 9. While it is true that plague extorts a considerably greater toll of the urban population than it does of the rural population, the reason may not wholly be the variation in the existence of facilities for evacuation. Greater congestion in towns and more favourable conditions for quick dissemination of infection through rats may also account for the higher mortality.

Paragraph 10. The first sentence is perhaps intended to convey the idea that the "on-season" of plague for the State or for any local area is constant. The rest of the paragraph is, from a scientific point of view, an extremely unsafe generalisation. There is nothing to warrant the assumption that the transmission of acquired immunity continuously from generation to generation would ultimately produce a race of immune rats. The short-lived epizootics and outbreaks of plague in various - - parts of Europe could not have been the result of immunity so acquired by rats. The fluctuations in the intensity of plague might, equally - - reasonably, be attributed to the intensification or attenuation, from causes unknown, of the virus that starts the epizootic and subsequent epidemic. The whole situation is one that has not emerged yet from - - obscurity. In a review of the kind proposed to be issued, care must be taken that surmises are not presented as established scientific facts.

Paragraphs11, 12 and 13 are also open to a similar objection. The paras may be modified somewhat as follows:-- " The season of the annual prevalence of plague- if it does break out in a town or village- is constant. A comparison of the quinquennial averages of the figures of plague mortality in the state reveals a gradual diminution in the intensity of the disease, which is perhaps to some extent accounted for by the immunity against plague acquired by rats and man as years go by.

"Dr Srinivasa Rao states that a mean temperature between 70 degrees and 80 degrees Fahrenheit, associated with a saturation deficiency less than 0.30 inch, is a condition that favors the outbreak and spread of plague. The disease is said to rapidly subside when the mean

temperature is in excess of 80 degrees Fahrenheit combined with a high saturation deficiency."

Paragraph 15. I would modify this para as follows:-- " As the compulsory segregation of patients and contacts and compulsory disinfection of effects were found to retard rather than to forward preventive opertaions by rousing popular resentment, they were given up after a short trial".

Paragraph 16. In (1) add after rat-fall, "on the occurrence of cases of plague". (2) Add " and in the infected locality".

Paragraph 17. For "attempted" substitute "practised".

Paragraph 18. This is not so in the case of towns as people continue to reside in the houses in spite of infection in the locality.

Paragraphs 16 to 19. These 5 paras may be suitably incorporated under "Anti-plague measures recommended for adoption" so as to give a proper setting to the several recommendations made.

Paragraph 21. The idea contained in "thorough" may be amplified. The word "infected" may be omitted as there are no facilities in villages to find out if a rat is infected or not. After dead rat, add "smell of dead rat."

Paragraph 22. I fear rather too much credence in the absolute -- efficacy of desiccation is implied. The great danger is the false sense of security engendered in the minds of people if desiccation alone were depended upon to the extent advocated. I have heard it said that, in a certain town, a year or two ago, the immediate reoccupation of affected houses after carrying out disinfection in the manner recommended was -- attended with disastrous results. Whether this was a fact, or not, my own experience in the Mysore City in 1903-04 was that desiccation had -- little effect in keeping down infection; yet, at that time a trained staff was set to do the work, paraffin thermometers were used to ensure that a high degree of heat was attained and the heat generated was kept up much longer than is possible by burning dry leaves as now recommended.

If at the same time that desiccation is done all the rats in the infected house and in the neighbourhood could be caught, killed and

102

and burnt or immersed in kerosine oil disinfection could be relied upon as a means of preventing infection. Otherwise, there can be no guarantee that other rats that might be ailing at the time do not die a few days later and set free a new batch of infected fleas to start and keep up an epidemic. It must not be forgotten that when a dead rat is found in a house, other rats are suffering from plague, in all probability in the same house, and certainly in the same locality. - - It must also be remembered that the heat generated by desiccation - - cannot penetrate tortuous rat-holes and can therefore have no effect on the rat-fleas execpt those that may happen to be loose on the - - floor at the time of dessiccation. Such fleas represent perhaps an infinetesimal fraction of the total number that are potential carriers of infection.

So long as an epizootic lasts i.e. for about 8 weeks, it is a safe plan to insist upon the evacuation of houses and not to place too much reliance on disinfection. No evacuated house should be re-occupied within two months: the prescribed limit of ten days is too short an interval. The re-occupation of the evacuated houses after two months may, as is usually done, be preceded by desiccation, whitewashing and the general tidying up of the houses and surroundings.

Paragraph 22. 3rd sentence:-- Rat-fleas may be found in grain but they do not infect it.

Paragraph 23 (i) If health camps are to be permitted to be occupied by people required to vacate their houses on account of rat-fall they will no longer be health-camps but contact camps. "Contacts" of " dead ~~and~~ rats" are more likely to catch the disease than contacts of - - human cases of plague. Only the neighbours of plague-affected houses might occupy health camps.

Paragraph 24. The First sentence may be omitted.

Paragraph 26. An extract from the letter of the Sanitary Commissioner with the Government of India as to how barium carbonate is made up into baits may be added. Rat-catching by traps and the rearing of cats may be recommended. It seems necessary also to lay stress on the

107

importance of people themselves resorting to rat-killing and rat - - catching operations in the off-season without expecting a Government agency to do the work for them.

There is evidently an error in the 1st sentence; A rat trap does not require a poisoned bait.

Paragraph 27. The memorandum referred to need not be separately issued if the broad outlines as to how to be rid of rats by the use of barium carbonate and by means of rat-traps are embodied in para 26.

Paragraph 29. "Rat-proof" condition should be "rat-free" - - condition. Much depends upon the habits of the people.

Paragraph 30. May be immediately followed by para 38 which contains practical hints as to the points that municipalities may usefully embody in their bye-laws.

Paragraph 49. Second sentence may be altered as follows: To - - ensure that disinfection is effectively carried out, it is best to employ a trained staff to do the work.

Paragraph 51. May be modified thus:-- His Highness's Government are confident that the measures now recommended constitute a great step forward in the endeavours to successfully combat plague in the State and trust that with the introduction of the Local Self-Government Scheme and the reorganisation of the Sanitary Department, these measures will be - - more effectively pursued in future.

A.K.Nair

Offg. Sanitary Commissioner.

G. R. S. Vl—G/32]

SUBJECT.....

.....

.....

Diary No. of letter replied to... 579

GENERAL AND REVENUE SECRETARIAT

( )

, the 191 .

Date of issue..... 28/1

Signed by.....

San Section ~~Cloth~~
92-18 File No. ~~17-69~~
82/5 Serial No. ~~75~~

No. 917450 Genl

To

~~D.B.~~ Ramachandra Mudr. Esq.,
Superintendent, Govt Printing.

Dear Sir,

In forwarding herewith the draft of a Government order, ~~ordered to be issued in print~~ re the review of measures taken in the past for the ~~control~~ arrest and prevention of plague in the state & proposals for improving the existing arrangements, ~~ordered to be issued in print~~; I am desired to request you

over.

105

~~for the~~ matter in type & send me set

you to be so good as to ~~submit at~~
as early as possible
~~every early date~~ two clean copies
of the proof of the same for the
approval of the Lord Lieut.

Yours sincerely

DCS
28/1/20

Chief Secretary Office

JHH CPB
28.1.20. 28/1

List of enclosures.

Copied by

Examined by

WD86—GPB—60,000—15-11-16

1787

106

Proceedings of the Government of
H. H. the Maharaja of Mysore.

San 92-18-16.

Order No.

Dated 1919.

The Government of His Highness the Maharaja have had under their consideration for some time past the ~~q~~ question of improving the existing ~~a~~ arrangements for combating the epidemic of plague in the State. To this end Dr. M. Srinivasa Rao, the late Sanitary Commissioner, submitted, on the eve of his retirement a note in which he has reviewed the situation from the first ~~appearance~~ outbreak of the disease in Mysore twentyone years ago and offered some useful suggestions for the future conduct of anti-plague operations. Government have also had the advantage of perusing the valuable memorandum of the Sanitary Commissioner with the Government of India on Plague preventive measures, issued some time back. Before dealing with these suggestions, it is necessary to take a retrospect of the extent to which the state has suffered from the ravages of plague and of the expedients adopted to minimise the same.

167

2. The first case of plague, definitely diagnosed as such, occurred in the Bangalore City on the 12th August 1898 and the disease rapidly assumed an epidemic form, affecting not only the entire district of Bangalore but also the adjoining Districts. of Kolar, Tumkur and Mysore. Since then these and other parts of the State with occasional exceptions, have been subject to ~~our~~ annual visitation of the ~~plague~~ epidemic, usually between October and ~~May~~ May, the outbreak having been severest in the years 1902, 1903 and 1904 with 26,301, 20,223 and 21,622 deaths respectively. The total number of plague attacks, during the 20 years ending with June 1918 was 2,73,084 and the total number of deaths 1,99,840.

3. Plague extorts a considerably heavier toll of the urban than of the rural population. The absence of adequate facilities for prompt evacuation the greater density of population and the large grain marts in cities and towns, favourable to the quick dissemination of infection through rats, appear to account for this fact. Atmospheric conditions also seem to have an intimate bearing upon the prevalence of plague. Dr.Srinivasa Rao states that a mean temperature between 70° and 80° Fahrenheit, associated with a "saturation deficiency" less than 0.30 inch is

188

highly favourable for the ~~starting and keeping up~~ outbreak and spread of a plague epidemic, and that when the mean temparature rises above 80° F with a high "saturation deficiency" the epidemic rapidly subsides.

4. The ~~initial~~ measures adopted in the beginning to check the spread of the disease were the following:-

(1) Detention and observation of persons coming from infected areas and disinfection of their luggage.

(2) Compulsory removal of plague patients to special hospitals.

(3) Compulsory isolation of ~~those~~ persons that come into contact with plague patients.

(4) Disinfection of infected houses and

(5) Inoculation of persons exposed to infection, with the plague vaccine.

The first three ~~expedients~~ measures, which were adopted in accordance with the theory of the means of dissemination of plague infection current at the time, were abandoned after a short trial, as the people ~~were~~ panic-stricken in the presence of a new danger, ~~and~~ were unprepared for such interference.

5. Plague is now known to be a disease of rats caused by the plague bacillus which is spread from rat to rat and from rat to man by the bite of the rat flea.

Rats being thus the medium of infection, anti-rat measures are of first importance in any anti-plague campaign, as they strike at the root of the evil. The decreased virulence of the disease in the second of the two decades under review is explained by Dr.Srinivasa Rao as possibly due to the rats having acquired a great immunity to the attacks of the plague bacillus and he is of opinion that when the susceptible rats are killed off the surviving animals are able to transmit their acquired and inherited immunity to their young ones - an immunity which is strengthened in each succeeding generation so that there must ultimately arise a race of rats which are practically proof against plague. But he adds that it must not be forgotten that the plague bacilli may develop an increased virulence so as to attack even immunised rats. Apart from theory, ~~for practical purposes~~ there can be no question that the real anti-plague measure is the dissociation of man from rats. This can be effected with any degree of success only through the exertions of the people themselves and a memorandum has accordingly been issued inviting the attention of the public to the importance of the destruction of rats in their houses. Neither the Government nor the local bodies can do much

in this direction and in fact the results of the attempts made at great expense by the Bangalore City Municipality for several years prior to 1911 to encourage the destruction of rats by offers of reward were inapplicable. It has been suggested that anti-rat compaigns can be carried on with most chance of success in the hot dry months of the off-plague season by the use of rat traps and rat poisons and that efforts should also be made at the same time to lessen the food and shelter for rats. Barium carbonate has been recommended as a very effective rat poison and the directions for using it for this purpose, as given in the memorandum of the Sanitary Commissioner with the Government of India, are reproduced below for the information of the public.

"One pound of powdered native barium carbonate is mixed thoroughly in an enamelled basin with three pounds of flour made from the grain which constitutes the staple food of the locality in which operations are to be carried out. Sufficient water is added to make the whole into a fairly firm paste. The resulting mass is sufficient for some 2,400 baits, each containing three grains of poison, which are conveniently rolled into pill form. Clean hands and dishes are necessary to avoid imparting to

the baits extraneous taste and odour which may diminish their attractiveness. Baits should be made fresh each day as hard stale bait is rarely eaten by rat.

"Poison baits made in the manner described should be laid in the evening four baits on a small piece of paper being placed in situations readily accessible to rats but not so readily accessible to children and domestic animals. Twelve baits, three groups, will be found generally sufficient for an average sized Indian room. A careful record of the baits set should be kept and in the morning all unconsumed baits should be collected and destroyed, note being made of the number consumed wholly or in part and the dead rats found should be counted and destroyed. This process can be repeated daily until no more baits are consumed. Another baiting of the village or town can be carried out some two weeks later. When baiting is being carried out special efforts should be made to encourage house-holders to keep all other available food for rat covered up especially at night. In laying baits the presence of rat holes or other indications of the presence of rats will afford useful indications as to where baits can be laid with most chance of success.

" If rat poisoning be carried out with careful attention to all these details, a very notable degree of success will be achieved with very appreciable benefit when plague threatens."

As regards the action to be taken by public authorities in this matter, Government expect every large Municipality to frame suitable bye-laws for insisting upon houses, shops, godowns and markets being rendered rat proof and what is more important still kept in a rat free condition. The Sanitary Commissioner with the Government of India lays special stress on the importance of controlling the grain trade in this connection, as plague is generally found to begin in places in the close vicinity of markets and grain stores, in consequence of the transport of rats from infected localities for which grain and similar merchandise offer facilities. To counteract the dissemination of infection through this means the same authority suggests the following as the desiderata of grain stores :-

"(1) Wherever possible the whole-sale storage of grain should be effected in buildings apart from those in which retail trade is carried on

(2) Wholesale grain stores should not be situated in close proximity to densely-crowded areas of a city.

(3) Whole-sale grain stores should never be utilised for purposes of human habitation.

(4) Bearing in mind that water is essential for the life of the rat, no water accessible to rats, or fresh vegetables should be allowed in whole-sale grain stores.

(5) As rats are unable to circumvent a smooth horizontal projection of nine inches, such a ledge surrounding a grain store on the top of a plinth 3 feet high is effective in prohibiting the ingress of rats. On the sides of the building in which the doors are situated, this ledge can conveniently be enlarged into a platform 2 feet or 2 feet 6 inches in width. Reinforced concrete is a suitable material for such ledges and platforms.

(6) The roof of the godowns should overhang this platform and ledge to prevent the accumulation of rain water therein.

(7) No steps or similar means of facilitating ingress should be allowed, In practice the inconvenience caused by the absence of such steps will be found inconsiderable. For unloading sacks

of grain designed for such a store the bullock cart can be pushed close to the platform, which is also at a convenient height to facilitate the deposit therein of sacks from a cooly's back.

(8) Rats will, from time to time, be introduced into such a store, but they will be compelled to leave in search of water and should find their return extremely difficult.

(9) In villages and places where the cost of such pucca buildings is prohibitive, relatively rat-free stores can be made of almost any material provided the roof is water tight, by raising the floor on uprights surmounted by rat-guards similar in design to those commonly employed on ship's cables. These uprights should be at least three feet high and would support the beams on which the floor rests. The floor might be made of wood. The space underneath the floor can be left open and kept free from weeds and rank-growth with but little trouble."

Government desire that in places which are important grain centres the Municipal Councils concerned should take action to control the grain trade on these lines.

The Railway goods sheds should similarly be kept free from rat infestation. The Agent, Mysore ~~State~~

Railways, is requested to take suitable steps to secure this result.

5. While the anti-rat campaign, outlined in the preceding paragraph, is intended to prevent the outbreak of plague in a plague-threatened area, other measures have to be resorted to to check the spread of the epidemic when it has actually broken out. The measures now in vogue are evacuation and disinfection of infected dwellings and inoculation with the plague vaccine of persons exposed to infection. Though these measures have been employed in the past with no small success ~~in securing immunity from infection~~, there is still room for improvement in their actual working so as to render them more effective.

6. If evacuation is to secure the desired ~~safety~~ result it should be both through and timely. The infected house should be vacated as soon as the infection is discovered and everything in the house should be removed to facilitate thorough disinfection as well as to prevent further rat infestation which cannot be avoided so long as there is any article in the house that would afford shelter or sustenance to rats. It is also important that the house should not be visited again on any account until it has been properly disinfected. No evacuated house should be reoccupied within two months and the reoccupation should be

preceded by desiccation, whitewashing and the general tidying up of the house and its surroundings.

Government hope that people will avail themselves of the facilities usually provided for evacuation viz., supply of bamboos from the Forest Department free to the poor and at cost price to others in villages where thatching materials are not easily available.

To facilitate prompt evacuation arrangements should be made in every municipality for the construction of sheds according to approved designs, the number of such sheds depending upon the population of the municipality and the extent of frequency and prevalence of the epidemic. Approved type designs have been forwarded with estimates to the Presidents of the District Boards and Municipal Councils.

Every local body should provide for the following:-

(1) Sheds for use as Health and Contact Camps.

(2) Isolation ward with necessary equipments.

(1) One watchman for the sheds (permanent)
(2) a disinfection gang.
(3) One attendant for the Isolation ward.
(4) cost of medicines and other contingencies.

The sheds should be substantially built and properly looked after to prevent deterioration.

117

The Sanitary Commissioner in consultation with the Deputy Commissioners is requested to select suitable sites for camping grounds in towns and important villages and arrange for water supply &c.

Various methods of disinfection were practised, disinfection of soil by various kinds of chemical disinfectants such as corrosible sublimate, phenyle and its congeners, disinfection by emulsion of kerosine oil or nesterine in soap solution and disinfection by heat and fumagation by burning neem leaves.

Disinfection by dessication in a simple form has been advocated during the past 2 years and should be carefully carried out ~~Immediately~~ immediately after the evacuation of the house and repeated once again before reoccupation if the house has been vacant for more then ten days.

All grains liable to infection should be exposed to bright sun light for at least a couple of hours.

8. Inoculation has been slowly making its way against much opposition and this work is now carried on by medical and sanitary officers. In Bangalore a lady Assistant Surgeon is deputed for inoculating gosha ladies. To obtain full benefit from inoculation it should be resorted to when the epidemic is in its incipient stage instead of when it is at its height as is the tendency at present. The following statement gives the number of people inoculated during the past 5 years and the incidence of plague mortality amongst them

Period	Number of persons inoculated.	Attacks among inoculated.	Deaths among inoculated.	Total attacks.	Total Deaths
1913-14	9,473	15	-	4,788	3,322
1914-15	21,308	13	2	7,021	4,789
1915-16	23,405	6	4	5,466	3,808
1916-17	93,931	51	20	16,552	11,755
1917-18	49,799	8	4	13,955	9,859

147

There are at present three plague hospitals in the State, one at Bangalore another at Mysore and the third at the Kolar Gold Fields. The number of patients admitted into these institutions during the past five years were :-

	Bangalore	Mysore	Kolar Gold Fields.
1913-14	52	19	70
1914-15	175	131	206
1915-16	17	7	8
1916-17	343	48	329
1917-18	128	13	3

Government have under active consideration proposals for making these institutions more useful. The construction of a new Epidemic Diseases Hospital also in Bangalore is under consideration of Government.

~~Health and Contact Camps have been provided in the cities of Bangalore and Mysore.~~ ~~All~~ other municipal towns with a population of 5000 and upwards should have a small isolation hospital in charge of the local medical officer, with about half a dozen beds, located as close to the dispensary as possible. The isolation wards should be furnished with cots, beddings, clothing and other equipment.

The total expenditure incurred from 1896-97 up to 1917-18 on account of plague preventive measures according to the Comptroller's account is Rs.29,29,804.

Amount spent from	Rupees.
State funds	26,30,249
Municipal funds	2,51,556
District "	29,106
Sanitary Board K. G. F.	18,893
Total. Rs.	29,29,804

Amildars and Deputy Amildars are provided with a permanent advance of Rs.50 for expenditure under epidemic charges, the advance being recouped from time to time.

The municipalities have been asked to make a provision of Rs.1,000/- for every 10,000 of population, for epidemic charges in their budgets.

121

In case of the available grant in the budget being found inadequate, the Municipal Councils may apply to Government for special grant-in-aid through the Sanitary Commissioner.

The Municipal Councils of Bangalore and Mysore cities are given half their expenditure on epidemics from State Funds.

The Sanitary Commissioner is request to submit to Government, at an early date, in consultation with the officers and local bodies concerned, a detailed statement showing the distribution of expenditure (out of the State grants and contributions for plague and other epidemic charges) for plague prevention disinfection and inoculation by:

(1) Public Health Department, and
(2) Municipalities and District Board

He should also submit to Government forecast of the expenditure to be incurred both during 1919-20 and for the next five years.

The only permanent or quasi-permanent establishment on any considerable scale maintained throughout the year partly from plague and partly from municipal funds was that for disinfection for the two cities and for the special work in connection with the frontier plague protection scheme in the districts.

Small establishments for varying temporary periods are entertained whenever necessary for attending on plague patients, for disinfection of houses &c.

The Deputy Commissioners have been authorised to incur an expenditure of Rs.50/- per mensem for temporary establishment for disinfection work. To ensure that disinfection is effectively carried out it is desirable to entrust the work of disinfection by desiccation to a trained staff. For this purpose, 2 or 3 men attached to the permenent conservancy staff in the Tauks as well as in the Municipalities may be trained in the technique of disinfection so that they may be deputed for preventive duty, their places being taken by the temporary gang newly employed. Similar training should be given through Sanitary Inspectors to a few local men in all important villages. In the case of affected villages, an itinerant gang may be employed during seasons of plague to practically demonstrate the method to the villagers. While employed on plague duty, they may be given a special allowance of Rs.5/- per mensem. This obviates the necessity of maintaining a disinfection establishment throughout the year. If necessary, a temporary gang of men may be employed on daily wages.

12

His Highness' Government desire that the measures herein recommended should be popularised by means of lectures and pamphlets and they trust that with the Local Self Government Scheme and the re-organization of the Sanitary Department already sanctioned the adoption of these measures will be facilitated. The Presidents of the Bangalore and the Mysore City Municipalities and the Deputy Commissioners of Districts are requested to submit at an early date detailed proposals for giving effect to these recommendations.

Chief Secretary to Governmen

The Sanitary Co
— Dy Commissioners of DS
— Presidents of the 5 municipl
Councils of B'lore, Mysore
— President K. P. T. Sary Board
— The Police Agent, Mysore Rail
— The Comptroller
— The Senior Surgeon
— The Conservator of Forests

Government of His Highness the Maharaja of Mysore.

GENERAL AND REVENUE DEPARTMENTS.

G. O. No. G. 18690-706——Sany. 92-18-16, dated 14th February 1920.

Plague Preventive Measures.

Passes orders on ——.

W D 1787—GPB—16-2-20—425

S.O.
124

Plague Preventive Measures.

No. G. 18690-706—San. 92-18-16, dated 14th February 1920.

PROCEEDINGS OF THE GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE.

GENERAL AND REVENUE DEPARTMENTS.

Order No. G. 18690-706—San. 92-18-16, dated 14th February 1920.

The Government of His Highness the Maharaja have had, under their consideration, for some time past the question of improving the existing arrangements for combating the epidemic of plague in the State. To this end Dr. M. Srinivasa Rao, the late Sanitary Commissioner, submitted, on the eve of his retirement, a note in which he has reviewed the situation from the first out-break of the disease in Mysore twenty-one years ago and offered some useful suggestions for the future conduct of anti-plague operations. Government have also had the advantage of perusing the valuable Memorandum of the Sanitary Commissioner with the Government of India on Plague Preventive Measures, issued some time back. Before dealing with these suggestions, it is necessary to take a retrospect of the extent to which the State has suffered from the ravages of plague and of the expedients adopted to minimise the same.

2. The first case of plague, definitely diagnosed as such, occurred in the Bangalore City on the 12th August 1898 and the disease rapidly assumed an epidemic form, affecting not only the entire district of Bangalore but also the adjoining districts of Kolar, Tumkur and Mysore. Since then, these and other parts of the State, with occasional exceptions, have been subject to annual visitation of the epidemic, usually between May and October, the outbreak having been severest in the years 1902, 1903 and 1904 with 26,301, 20,223 and 21,622 deaths respectively. The total number of plague attacks, during the 20 years ending with June 1918, was 273,084 and the total number of deaths 199,840.

3. Plague extorts a considerably heavier toll of the urban than of the rural population. The absence of adequate facilities for prompt evacuation, the greater density of population and the large grain marts in cities and towns, favourable to the quick dissemination of infection through rats, appear to account for this fact. Atmospheric conditions also seem to have an intimate bearing upon the prevalence of plague. Dr. Srinivasa Rao states that a mean temperature between 70° and 80° Fahrenheit, associated with a "saturation deficiency" less than 0·30 inch is highly favourable for the out-break and spread of the epidemic, and that when the mean temperature rises above 80° F. with a high "saturation deficiency", the epidemic rapidly subsides.

4. The measures adopted in the beginning to check the spread of the disease were the following:—

(1) Detention and observation of persons coming from infected areas and disinfection of their luggage.
(2) Compulsory removal of plague patients to special hospitals.
(3) Compulsory isolation of persons that came into contact with plague patients.
(4) Disinfection of infected houses
and (5) Inoculation of persons exposed to infection, with the plague vaccine

The first three measures, which were adopted in accordance with the theory of the means of dissemination of plague infection current at the time, were abandoned after a short trial, as the people, panic-stricken in the presence of a new danger were unprepared for such interference.

5. Plague is now known to be a disease of rats caused by the plague bacillus which is spread from rat to rat and from rat to man by the bite of the rat flea. Rats being thus the medium of infection, anti-rat measures are of first importance in any anti-plague campaign, as they strike at the root of the evil. The decreased

virulence of the disease in the second of the two decades under review is explained by Dr. Srinivasa Rao as possibly due to the rats having acquired great immunity to the attacks of the plague bacillus and he is of opinion that when the susceptible rats are killed off the surviving animals are able to transmit their acquired and inherited immunity to their young ones, an immunity which is strengthened in each succeeding generation so that there must ultimately arise a race of rats which are practically proof against plague. But he adds that it must not be forgotten that the plague bacilli may develop an increased virulence so as to attack even immunised rats. Apart from theory, there can be no question that the real anti-plague measure is the dissociation of man from rats. This can be effected with any degree of success only through the exertions of the people themselves and a Memorandum has accordingly been issued inviting the attention of the public to the importance of the destruction of rats in their houses. Neither the Government nor the local bodies can do much in this direction and in fact the results of the attempts made at great expense by the Bangalore City Municipality for several years prior to 1911 to encourage the destruction of rats by offers of reward were inappreciable. It has been suggested that anti-rat campaigns can be carried on with most chance of success in the hot dry months of the off-plague season by the use of rat traps and rat poisons and that efforts should also be made at the same time to lessen food and shelter for rats. Barium carbonate has been recommended as a very effective rat poison and the directions for using it for this purpose, as given in the Memorandum of the Sanitary Commissioner with the Government of India, are reproduced below for the information of the public:—

"One pound of powdered native barium carbonate is mixed thoroughly in an enamelled basin with three pounds of flour made from the grain which constitutes the staple food of the locality in which operations are to be carried out. Sufficient water is added to make the whole into a fairly firm paste. The resulting mass is sufficient for some 2,400 baits, each containing three grains of poison, which are conveniently rolled into pill form. Clean hands and dishes are necessary to avoid imparting to the baits extraneous taste and odour which may diminish their attractiveness. Baits should be made fresh each day as hard stale bait is rarely eaten by rat."

"Poison baits made in the manner described should be laid in the evening, four baits on a small piece of paper being placed in situations readily accessible to rats but not so readily accessible to children and domestic animals. Twelve baits, three groups, will be found generally sufficient for an average sized Indian room. A careful record of the baits set should be kept and in the morning all unconsumed baits should be collected and destroyed, note being made of the number consumed wholly or in part and the dead rats found should be counted and destroyed. This process can be repeated daily until no more baits are consumed. Another baiting of the village or town can be carried out some two weeks later. When baiting is being carried out, special efforts should be made to encourage house-holders to keep all other available food for rat covered up especially at night. In laying baits, the presence of rat holes or other indications of the presence of rats will afford useful indications as to where baits can be laid with most chance of success."

"If rat poisoning be carried out with careful attention to all these details, a very notable degree of success will be achieved with very appreciable benefit when plague threatens."

6. As regards the action to be taken by public authorities in this matter, Government expect every large Municipality to frame suitable bye-laws for insisting upon houses, shops, godowns and markets being rendered rat-proof and, what is more important still, kept in a rat-free condition. The Sanitary Commissioner with the Government of India lays special stress on the importance of controlling the grain trade in this connection, as plague is generally found to begin in places in the close vicinity of markets and grain stores, in consequence of the transport of rats from infected localities for which grain and similar merchandise offer facilities. To counteract the dissemination of infection through this means, the same authority suggests the following as the *desiderata* of grain stores:—

"(1) Wherever possible, the wholesale storage of grain should be effected in buildings apart from those in which retail trade is carried on.

No. G. 18690-706—San. 92-18-16, dated 14th February 1920.

(2) Wholesale grain stores should not be situated in close proximity to densely-crowded areas of a city.

(3) Whole-sale grain stores should never be utilised for purposes of human habitation.

(4) Bearing in mind that water is essential for the life of the rat, no water accessible to rats, or fresh vegetables should be allowed in wholesale grain stores.

(5) As rats are unable to circumvent a smooth horizontal projection of nine inches, such a ledge surrounding a grain store on the top of a plinth 3 feet high is effective in prohibiting the ingress of rats. On the sides of the building in which the doors are situated, this ledge can conveniently be enlarged into a platform 2 feet or 2 feet 6 inches in width. Re-inforced concrete is a suitable material for such ledges and platforms.

(6) The roof of the godowns should overhang this platform and ledge to prevent the accumulation of rain water therein.

(7) No steps or similar means of facilitating ingress should be allowed. In practice, the inconvenience caused by the absence of such steps will be found inconsiderable. For unloading sacks of grain designed for such a store, the bullock cart can be pushed close to the platform, which is also at a convenient height to facilitate the deposit therein of sacks from a cooly's back.

(8) Rats will, from time to time, be introduced into such a store, but they will be compelled to leave in search of water and should find their return extremely difficult.

(9) In villages and places where the cost of such *pucca* buildings is prohibitive, relatively rat-free stores can be made of almost any material provided the roof is water-tight, by raising the floor on uprights surmounted by rat-guards similar in design to those commonly employed on ship's cables. These uprights should be at least 3 feet high and would support the beams on which the floor rests. The floor might be made of wood. The space underneath the floor can be left open and kept free from weeds and rank-growth with but little trouble."

Government desire that, in places which are important grain centres, the Municipal Councils concerned should take action to control the grain trade on these lines.

The Railway Goods Sheds should similarly be kept free from rat infestation. The Agent, Mysore Railways, is requested to take suitable steps to secure this result.

7. While the anti-rat campaign, outlined in the preceding paragraph, is intended to prevent the outbreak of plague in a plague-threatened area, other measures have to be resorted to to check the spread of the epidemic when it has actually broken out. The measures now in vogue are evacuation and disinfection of infected dwellings and inoculation with the plague vaccine of persons exposed to infection. Though these measures have been employed in the past with no small success, there is still room for improvement in their actual working so as to render them more effective.

8. If evacuation is to secure the desired result, it should be both thorough and timely. The infected house should be vacated as soon as the infection is discovered and everything in the house should be removed to facilitate thorough disinfection as well as to prevent further rat infestation which cannot be avoided so long as there is any article in the house that would afford shelter or sustenance to rats. It is also important that the house should not be visited again on any account until it has been properly disinfected. No evacuated house should be re-occupied within two months and the re-occupation should be preceded by desiccation, lime white washing and the general tidying up of the house and its surroundings.

Government trust that the people will avail themselves of the facilities usually provided for evacuation, *viz.*, supply of bamboos from the Forest Department free to the poor and at cost price to others in villages where hutting materials are not easily available.

127

No. G. 18690-706—San. 92-18-16, dated 14th February 1920.

To facilitate prompt evacuation, arrangements should be made in every Municipality for the construction of sheds according to approved designs, the number of such sheds depending upon the population of the Municipality and the frequency and extent of prevalence of the epidemic. Approved type designs have been forwarded with estimates to the Presidents of the District Boards and Municipal Councils.

The sheds should be substantially built and properly looked after to prevent deterioration.

The Deputy Commissioners, in consultation with the Sanitary Commissioner, are requested to select suitable sites for camping grounds in towns and important villages and arrange for water-supply, etc.

9. Various methods of disinfection were practised, disinfection of soil by various kinds of chemical disinfectants such as corrosive sublimate, phenyle and its congeners, disinfection by emulsion of kerosine oil or pesterine in soap solution and disinfection by heat and fumigation by burning *neem* leaves. Disinfection by dessication in a simple form has been advocated during the past two years and should be carefully carried out immediately after the evacuation of the house and repeated once again before re-occupation if the house has been vacant for more than ten days. All grains liable to infection should be exposed to bright sun-light for at least a couple of hours.

10. Inoculation has been slowly making its way against much opposition and this work is now carried on by medical and sanitary officers. In Bangalore, a Lady Assistant Surgeon is deputed for inoculating gosha ladies. To obtain full benefit from inoculation, it should be resorted to when the epidemic is in its incipient stage instead of when it is at its height as is the tendency at present. The following statement gives the number of people inoculated during the past five years and the incidence of plague mortality amongst them:—

Period	Number of persons inoculated	Attacks among inoculated	Deaths among inoculated	Total attacks	Total deaths
1913-14	9,473	15	...	4,788	3,322
1914-15	21,308	13	2	7,021	4,789
1915-16	23,405	6	4	5,466	3,808
1916-17	93,931	51	20	16,552	11,755
1917-18	49,799	8	4	13,955	9,859

11. There are at present three plague hospitals in the State, one at Bangalore another at Mysore and the third at the Kolar Gold Fields. The number of patients admitted into these institutions during the past five years were:—

	Bangalore	Mysore	Kolar Gold Fields
1913-14	52	19	70
1914-15	175	131	206
1915-16	17	7	8
1916-17	343	48	329
1917-18	128	13	3

Government have under active consideration proposals for making these institutions more useful. The construction of a new Epidemic Diseases Hospital in Bangalore is also under the consideration of Government.

Other municipal towns with a population of 5,000 and upwards should have a small isolation hospital in charge of the local medical officer, with about half a dozen beds, located as close to the dispensary as possible. The isolation wards should be furnished with cots, bedding, clothing and other equipment.

No. G. 18690-706—San. 92-18-16, dated 14th February 1920.

12. The total expenditure incurred from 1896-97 up to 1917-18 on account of plague preventive measures according to the Comptroller's account is Rs. 29,29,804.

Amount spent from	Rs.
State funds	26,30,249
Municipal funds	2,51,556
District funds	29,106
Sanitary Board, Kolar Gold Fields	18,893
Total ...	29,29,804

Amildars and Deputy Amildars are provided with a permanent advance of Rs. 50 for expenditure under epidemic charges, the advance being recouped from time to time.

The municipalities have been asked to make a provision of Rs. 1,000 for every 10,000 of population, for epidemic charges in their budgets.

In case of the available grant in the budget being found inadequate, the Municipal Councils may apply to Government for special grant-in-aid through the Sanitary Commissioner.

The Municipal Councils of Bangalore and Mysore Cities are given half their expenditure on epidemics from State Funds.

The Sanitary Commissioner is requested to submit to Government, at an early date, in consultation with the officers and local bodies concerned, a detailed statement showing the distribution of expenditure (out of the State grants and contributions for plague and other epidemic charges) for plague prevention, disinfection and inoculation by

(1) the Public Health Department, and

(2) the Municipalities and District Boards.

He should also submit to Government a forecast of the expenditure to be incurred both during 1920-21 and for the next five years.

13. The only permanent or quasi-permanent establishment on any considerable scale maintained throughout the year partly from plague and partly from municipal funds is that for disinfection for the two cities and for the special work in connection with the frontier plague protection scheme in the districts.

Small establishments for varying temporary periods are entertained whenever necessary for attending on plague patients, for disinfection of houses, etc. The Deputy Commissioners have been authorised to incur an expenditure of Rs. 50 per mensem for temporary establishment for disinfection work.

To ensure that disinfection is effectively carried out, it is desirable to entrust this work to a trained staff. For this purpose, a few men attached to the permanent conservancy staff in each place should be trained in the technique of disinfection so that they may be employed on disinfection work whenever necessary, their places being taken temporarily by men to be newly engaged. Similar training should be given through Sanitary Inspectors to a few village servants in all important villages. When the number of affected villages is large, an itinerant gang may also be temporarily employed to practically demonstrate the method of disinfection to the villages under the supervision of the Sanitary Inspectors. These arrangements will obviate the necessity of maintaining a disinfection establishment throughout the year.

14. His Highness' Government desire that the measures herein recommended should be popularised by means of lectures and pamphlets and they trust that with the Local Self-Government Scheme and the re-organization of the Sanitary Department already sanctioned, the adoption of these measures will be facilitated. The Presidents of the Bangalore and the Mysore City Municipalities and the Deputy Commissioners of Districts are requested to submit at an early date detailed proposals for giving effect to these recommendations.

C. S. BALASUNDARAM IYER,
Chief Secretary to Government.

To—The Sanitary Commissioner.
The Deputy Commissioners of Districts.
The Presidents of the City Municipal Councils of Bangalore and Mysore.
The President, Kolar Gold Field Sanitary Board.
The Agent, Mysore Railways.
The Comptroller.
The Senior Surgeon.
The Conservator of Forests.

Exd.—c/ Press Table
Copy to Rev Sect.